

BIOLOGY

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DIVERSITY IN THE LIVING WORLD (The Living World to Classification) # 01

1. Select true statement from followings :-
 - (1) Consciousness is not a defining feature of living being
 - (2) Sum total of all bio chemical reactions going on in a body are called metabolism
 - (3) Response to external stimulus is called as homeostasis
 - (4) Growth is a defining feature of living beings
2. Study the following statements carefully :-
 - (A) All plants, animals, fungi and microbes exhibit metabolism
 - (B) Perhaps, the most obvious and technically complicated feature of all living organisms is the ability to sense their surroundings or environment and respond to these stimuli
 - (C) All organisms have consciousness but the human has self consciousness and not the consciousness
 - (D) Living organisms are self replicating, and evolving but not self regulating

Find the most correct option from the followings:

 - (1) A, B and C are correct and D is incorrect
 - (2) A and B are correct and C and D are incorrect
 - (3) A and B are incorrect and C and D are correct
 - (4) A is correct and B, C and D are incorrect
3. Select the correct match from following :
 - (1) Growth-only living organism
 - (2) Reproduction-only living organism
 - (3) Self consciousness-all living organism
 - (4) Metabolism-living and non living both
4. Growth and reproduction are synonymous in
 - (1) All living organism
 - (2) All unicellular organism
 - (3) All plants
 - (4) All multicellular organism
5. In which of the modern discipline of taxonomy, each character is given equal weightage to classify the organisms ?
 - (1) Natural
 - (2) Chemotaxonomy
 - (3) Numerical
 - (4) Cytotaxonomy
6. When taxonomy is based on chromosome number, structure and behaviour then it is called as :-
 - (1) Chemotaxonomy
 - (2) Numerical taxonomy
 - (3) Cytotaxonomy
 - (4) Classical taxonomy
7. Taxonomy based on chemical constituent of plants is called :-
 - (1) Cytotaxonomy
 - (2) Classical taxonomy
 - (3) Chemotaxonomy
 - (4) Karyotaxonomy
8. Which of the following statements regarding nomenclature is correct ?
 - (1) Generic name always begins with small letter whereas specific epithet with capital letter.
 - (2) Scientific name should be printed in italics.
 - (3) Scientific name when typed or handwritten should be separately underlined.
 - (4) Both (2) & (3)
9. Nomenclature is governed by certain universal rules. Which one of the following is true to the rules of nomenclature?
 - (1) Biological names are given in latin language
 - (2) The first word in a biological name represents the species name, and the second is a specific epithet
 - (3) The names are in English and are italicised
 - (4) When written by hand, the names are to be Italicized
10. Which of the following is not correct for classification
 - (1) Carolus Linnaeus classification is an artificial classification
 - (2) Large number of characters can be used in numerical classification
 - (3) Equal weightage is given to vegetative and reproductive characters in natural classification
 - (4) All of the above

11. Which of the following is a correct name according to ICBN?
- Mangifera mangifera*
 - Mangifera indica linn.*
 - Mangifera indica Linn.*
 - Mangifera indica Linn.*
12. In numerical classification :
- Only morphological characters are used
 - More weightage is given to reproductive characters
 - It is one of earliest classification
 - It is based on numbers of similarities and dissimilarities
13. Which of the following is not matched correctly?
- Phylogenetic classification : Mainly based on evolutionary relationship
 - Practical classification : Based on economic importance
 - Linnaeus classification : Based on one or two morphological characters
 - Natural classification : Based on superficial morphology
14. Identify two correct statements from statements given below and identify the correct option from options given below :-
- First scientific classification was practical classification.
 - Linnaeus classification is a natural classification because it is based on floral characters.
 - Scientific names of plants are given on the basis of ICBN.
 - Mangifera* in *Mangifera indica* denotes generic name.
- Option :-**
- A & B
 - B & C
 - A & D
 - C & D
15. Linnaeus proposed scientific nomenclature of plants on :-
- 1 May 1758
 - 1 May 1753
 - 1 August 1758
 - 1 August 1753

DIVERSITY IN THE LIVING WORLD (Taxonomic Categories to Carl Woese) # 02

1. Arrange the following taxonomic categories in ascending order beginning from fundamental unit of classification :-

- (i) Division (ii) Family
(iii) Class (iv) Species
(v) Order (vi) Genus
(vii) Kingdom

- (1) iv → vi → ii → v → iii → i → vii
(2) iv → vi → ii → iii → i → vii → v
(3) iv → vi → iii → ii → v → vii → i
(4) iv → vi → ii → iii → v → i → vii

2. Which of the following taxonomic category is smallest ?

- (1) Species
(2) Class
(3) Division
(4) Kingdom

3. Convenient groups which we use to study the organisms in classification are called :-

- (1) Order
(2) Class
(3) Division
(4) Taxa

4. When we move from species to kingdom in taxonomic hierarchy. The common characters from one taxon to another taxon :

- (1) Can increase
(2) Can decrease
(3) Always decrease
(4) Can decrease or increase

5. The taxonomic aid, used for identification of both plants and animals is :-

- (1) Herbarium
(2) Botanical garden
(3) Flora
(4) Taxonomic keys

6. Arrange the following events of preservation of insects :-

- A. Pinning B. Killing
C. Insect box D. Collecting

Option :-

- (1) (D), (C), (B), (A)
(2) (D), (B), (C), (A)
(3) (D), (B), (A), (C)
(4) (C), (D), (B), (A)

7. Identify the correct from the Column I, II and III

Column I		Column II		Column III	
A.	Herbarium	(a)	Living form	(i)	Quick referral system
B.	Museum	(b)	Dead form	(ii)	Ex situ conservation
C.	Zoological parks	(c)	Dried form	(iii)	Set up in educational institutes
D.	Botanical gardens			(iv)	Related with food habit and behaviour

- (1) A-b-i, C-c-i, B-b-ii, D-a-iv
(2) B-b-iii, D-a-i, C-b-ii, A-c-iv
(3) D-a-i, B-c-ii, C-a-iv, A-a-i
(4) C-a-iv, A-c-i, B-b-iii, D-a-ii

8. Find the incorrect about herbarium :-

- (1) It is a store house of collected dried plant specimens
(2) It consists many herbarium sheets arranged in universally accepted system of classification
(3) Herbarium sheets also carry a label written with complete photo profile of the collector of that specimen.
(4) Herbaria also serve as quick referral system in taxonomic studies.

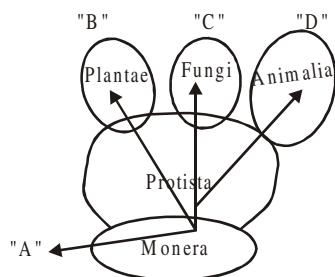
9. Taxonomical aid, which contain information on any one taxon :-

- (1) Herbarium
(2) Manual
(3) Monograph
(4) Zoological park

10. Biological concept of species is applicable on:-

- (1) Eukaryotes
(2) *Acetobacter*
(3) Mule
(4) *Mycoplasma*

11. Find the "A" from the shows figure



Select the answer:-

- (1) Chemosynthesis (2) Photosynthesis
(3) Absorption (4) Ingestion
12. According to R.H. Whittaker, *Euglena* and *Chlorella* are placed in which kingdom ?
(1) Fungi (2) Monera
(3) Protista (4) Plantae
13. Two kingdom classification system used for a long time was inadequate, so a need was felt for including besides gross morphology, other characteristics also. What were these characters which resulted in formation of five kingdom classification system ?
(a) Cell structure
(b) Mode of nutrition
(c) Reproduction
(d) Evolutionary relationship
- Options :**
(1) a & b only (2) a, b & c only
(3) a, c & d only (4) a, b, c & d

14. Whose classification method is being used in majority of the well known herbaria of the world?

- (1) Classification method by Eichler
(2) Classification method by Whittaker
(3) Classification method by Bentham & Hooker
(4) Classification method by Woese

15. Which one of the following is a domain ?

- (1) Archaeobacteria (2) Bacteria
(3) Monera (4) Plantae

16. Study the four statements (A–D) given below and select the two incorrect out of them :

- (A) Biological species concept was given by Ernst Mayr.
(B) Maximum common character among organisms are found at kingdom level.
(C) Binomial nomenclature system was given by R.H. Whittaker.
(D) *Musca* is the genus of house fly.

The two **incorrect** statements are :-

- (1) A and D
(2) A and B
(3) B and C
(4) C and D

DIVERSITY IN THE LIVING WORLD (Kingdom - Monera) # 03

1. Cell envelope of a typical bacterial cell does not include :
 (1) Glycocalyx (2) Cell wall
 (3) Cell membrane (4) Cytoplasm
2. Which option is not related with prokaryotes?
 (1) Inclusion bodies are not bounded by any membrane system and lies free in the cytoplasm
 (2) Ribosomes are the site of protein synthesis
 (3) Genetic material are not covered by nuclear membrane
 (4) They reproduce sexually by a process involving cell fusion and zygote formation
3. Which one of the following structure is found in prokaryotes but absent in eukaryotes?
 (1) Cell wall and cell membrane
 (2) Mesosome and plasmid
 (3) Cytoplasm and ribosome
 (4) Ribosome and gas vacuole
4. Which of the following is **false** for mesosomes?
 (1) Mesosomes are infoldings of cell membrane in prokaryotes
 (2) Mesosomes are extensions of cell membrane in prokaryotes
 (3) Mesosomes are helpful in respiration in prokaryotes
 (4) Mesosomes are helpful in cell division in eukaryotes
5. Mark out the correct statements
 (I) Mesosomes are invaginated structures that is formed by plasma membrane.
 (II) Glycocalyx is not the part of cell envelope
 (III) Mesosome helps in distribution of DNA to the daughter cells in prokaryotes.
 (IV) Pili do not play role in motility
 (V) Chromatophores are the reserve food material of cyanophycean cell.
 (1) II, III and IV (2) I, II and V
 (3) I, III and IV (4) I, II and III
6. Nitrifying bacteria convert :-
 (1) Nitrogen into nitrates
 (2) Ammonia or Ammonium compound into nitrates
 (3) Nitrate into nitrogen
 (4) Carbon dioxide into carbohydrates
7. Which bacteria are mostly used for genetic engineering ?
 (1) *E. coli* and *Spirulina*
 (2) *E. coli* and *Agrobacterium*
 (3) *Salmonella* and *Pseudomonas*
 (4) *E. coli* and *Salmonella*
8. What is incorrect for chemosynthetic autotrophic bacteria ?
 (1) Oxidise various organic and inorganic substances
 (2) Uses the energy released through oxidation for their ATP production
 (3) Play great role in recycling of nutrients like nitrogen, phosphorus, iron and sulphur
 (4) They are most abundant in nature
9. Which statement is/are correct regarding heterocyst?
 (1) It is thick walled non green cell
 (2) Can fix atmospheric nitrogen
 (3) Found in *Nostoc*
 (4) All the above
10. Which structure is responsible for nitrogen fixation in *Anabaena* ?
 (1) hormogonia
 (2) hormocyst
 (3) heterocyst
 (4) Akinetes
11. Hormogonia are the vegetatively reproducing structures of :-
 (1) *Ulothrix*
 (2) *Spirogyra*
 (3) *Oscillatoria*
 (4) *Chlamydomonas*

12. Which one of the following is exclusively found in blue green algae but not found in any other prokaryotes?
- (1) Peptidoglycan cell wall
 - (2) Chlorophyll 'a'
 - (3) Lipoprotein's cell membrane
 - (4) Nitrogen fixation ability
13. Which among the following are the smallest living cells known, without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen ?
- (1) *Pseudomonas*
 - (2) *Mycoplasma*
 - (3) *Nostoc*
 - (4) *Bacillus*
14. Heterotrophic filamentous nitrogen fixing monerian is :-
- (1) Actinomycetes
 - (2) *Mycoplasma*
 - (3) Archaeobacteria
 - (4) Cyanobacteria
15. Choose the incorrect match from following :-
- (1) Actinomycetes → Methane producing bacteria
 - (2) Eubacteria → Nitrogen fixation ability
 - (3) Cyanobacteria → Oxygenic photosynthetic ability
 - (4) *Mycoplasma* → Wall less facultative anaerobic

DIVERSITY IN THE LIVING WORLD (Kingdom Protista and Fungi) # 04

- Boundaries of which of the following kingdom are not well defined ?
(1) Plantae (2) Protista
(3) Animalia (4) Fungi
- Protist includes :-
(1) Unicellular eukaryotes
(2) Multicellular prokaryotes
(3) Unicellular prokaryotes
(4) All of these
- Which one of the following is **incorrect** about chrysophytes ?
(1) They float passively with water current
(2) They are microscopic
(3) This group includes diatoms & desmids
(4) Most of them have two flagella, one lies longitudinally and the other transversely in a furrow
- Find out the match that is **not correct** for given organisms -
(1) Slime moulds - absorptive mode of nutrition
(2) Dinoflagellates - soap box like cell walls
(3) Euglenoids - Majority of them are fresh water organisms
(4) Diatoms - float passively in water currents
- How many organisms in the list given below belong to protista according to Whittaker's kingdom?
Euglena, Nostoc, Chlorella, Azolla, Physarum, Spirulina, Azotobacter
(1) Two (2) Three (3) Six (4) Four
- Organism having pellicle which makes their body flexible are also characterised by the presence of all except :-
(1) Pigments are identical to those present in higher plants
(2) Behave like heterotrophs by predating on other smaller organism when deprived of sunlight
(3) Having silicified and indestructible cell wall
(4) Heterokont (two types of flagella) type of flagellation in which one is short and other is long
- Which of the following feature is/are associated with protista ?
(a) Zygote formation
(b) Primarily aquatic
(c) Flagellated structures are absent in all members
(d) Well defined nucleus
(e) Shows various type of nutrition
(1) a, c, d (2) a, b, d, e
(3) b, c, d, e (4) c, d, e
- How many of the following produce asexual spore endogenously?
Mucor, Aspergillus, Claviceps, Agaricus, Rhizopus, Albugo, Trichoderma, Phytophthora
(1) Five (2) Four
(3) Three (4) Six
- Which of the following can not be used to differentiate ascomycetes and basidiomycetes?
(1) Type of sexual spore
(2) Septate mycelium
(3) Fruiting body
(4) Clamp connection
- Select the incorrect pair :-
(1) *Colletotricum* - Red rot of sugarcane
(2) *Puccinia* - Red rust of tea
(3) *Claviceps* - Ergot disease of bajara
(4) *Helminthosporium* - Leaf spot of rice
- Which of the following method of sexual reproduction is commonly found in basidiomycetes ?
(1) Gametangial contact
(2) Conidia
(3) Somatogamy
(4) Gametangial copulation
- Read the following points :-
A. Asexual reproduction with the help of conidia
B. Produce different types of fruiting bodies
C. Sexual spores produce endogenously
D. Karyogamy and meiosis takes place in sac like structure
All these points belong to which class of fungi?
(1) Zygomycetes (2) Basidiomycetes
(3) Ascomycetes (4) Oomycetes

13. Dikaryotic stage in fungi means :-

- (1) Two diploid nucleus in each cell
- (2) Two haploid nucleus in each cell
- (3) Two diploid nucleus in two cell
- (4) One haploid nucleus in two cell

14. The main characteristic of class ascomycetes is:-

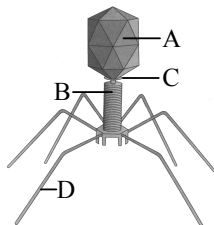
- (1) Formation of spores
- (2) Hyphae
- (3) Formation of ascospores
- (4) Formation of zoospores

15. The imperfect fungi which are decomposers of litter and help in mineral cycling belong to :

- (1) Ascomycetes (2) Deuteromycetes
- (3) Basidiomycetes (4) Phycomycetes

DIVERSITY IN THE LIVING WORLD (Virus, Lichens, Mycorrhiza & Algae) # 05

1. Given below is the diagram of a bacteriophage. In which one of the options, all the four parts A, B, C and D are correctly identified :-



	A	B	C	D
(1)	Tail fibres	Head	Sheath	Collar
(2)	Sheath	Collar	Head	Tail fibres
(3)	Head	Sheath	Collar	Tail fibres
(4)	Collar	Tail fibres	Head	Sheath

2. Mycorrhiza is :-
 (1) Symbiotic association between algae and fungi
 (2) Symbiotic association between fungi and animal
 (3) Symbiotic association between plant and animal
 (4) Symbiotic association between fungi and roots of higher plants
3. Lichens are the best indicators of :-
 (1) Water pollution (2) Soil pollution
 (3) Air pollution (4) Noise pollution
4. Mumps, small pox, herpes diseases are caused by :-
 (1) Bacteria
 (2) Fungi
 (3) Virus
 (4) Protozoa
5. Match the column-I & II :-

	Column-I		Column-II
(A)	<i>Spirogyra</i>	(i)	Reticulate
(B)	<i>Chlamydomonas</i>	(ii)	Discoid
(C)	<i>Ulothrix</i>	(iii)	Girdle shaped
(D)	<i>Chara</i>	(iv)	Ribbon shaped
(E)	<i>Oedogonium</i>	(v)	Cup shaped

Option :

- (1) A-iv, B-v ; C-iii, D-ii, E-i
 (2) A-i, B-v ; C-ii, D-iii, E-iv
 (3) A-iii, B-iv ; C-v, D-i, E-ii
 (4) A-iv, B-iii ; C-i, D-ii, E-iv
6. Cell wall is made up of an inner layer of cellulose and an outer layer of pectose in :-
 (1) *Nostoc*
 (2) *Euglena*
 (3) *Spirogyra*
 (4) Both (1) & (2)
7. Pyrenoids are found in
 (1) Mitochondria of green algae
 (2) Chloroplast of green algae
 (3) Chloroplast of all vascular plants
 (4) Chloroplast of all seed plants
8. In the member of phaeophyceae which part of body mainly functions as photosynthetic part?
 (1) Stalk
 (2) Stipe
 (3) Hold fast
 (4) Frond
9. Alginates, Iodine and Bromine are obtained from:-
 (1) *Gelidium*
 (2) *Gracillaria*
 (3) *Laminaria*
 (4) *Chondrus*
10. Analyse the following characteristics and identify the group of organisms :-
 (A) They reproduce sexually by the fusion of non-motile gametes
 (B) They show complex developmental changes after fertilization
 (C) Majority of organisms are marine with greater concentration found in warmer areas.
 (D) They have chlorophyll a, d and phycoerythrin as major pigments
 (1) Phaeophyceae
 (2) Chlorophyceae
 (3) Rhodophyceae
 (4) Dinoflagellates

11. Match the Column-I with Column-II :-

Column – I

(A) Green algae

(B) Blue green algae

(C) Diatom

(D) Brown algae

Column – II

(I) Cyanophyceae granules

(II) Laminarin

(III) Leucosin

(IV) Starch

A B C D

(1) I II IV III

(2) IV I III II

(3) II I III IV

(4) I III II IV

12. Select the correct statement :-

(1) Green algae are ancestors of land plants

(2) Red algae are ancestors of land plants.

(3) Phaeophyceae is ancestors of land plants.

(4) BGA show non-oxygenic synthesis only.

13. Find the **correct** statement :-

(1) *Ulothrix* and *Spirogyra* show Oogamy type of syngamy

(2) Red algae have a dominant pigment r-phycoerythrin

(3) Red algae produce gametes with two equal lateral flagella

(4) Agar is obtained from *Gelidium* and *Gracilaria*

14. *Euglena*, *Nostoc*, *Chlorella* and *Spirogyra*. Choose correct option regarding above organisms:-

(1) All are unicellular eukaryotes

(2) All are autotrophic multicellular organism

(3) All have chlorophyll 'a' and photosynthetic ability

(4) All belong to green algae

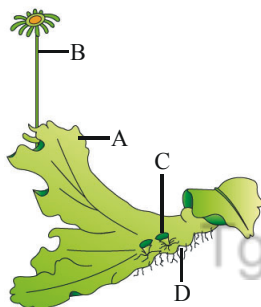
15. How many autotrophs are present in given set of organism?

Nostoc, *Chara*, *Chlamydomonas*, *Albugo*, *Nitrosomonas*, *Frankia*, *Lactobacillus*, *Azolla*, *Tricoderma*

(1) 4 (2) 6 (3) 5 (4) 7

DIVERSITY IN THE LIVING WORLD (Bryophyta, Pteridophyta & Gymnosperm)#06

- Which is intermediate stage between protonema and leafy gametophyte ?
(1) Spore
(2) Bud
(3) Prothallus
(4) Thalloid body
- Bryophytes resemble pteridophytes in :
(1) Having Motile antherozoids
(2) Formation of embryo from the zygote
(3) Archegonia as the female sex organ
(4) All of the above
- Examine the figure given below and select the right option in which all the four labelled parts (A, B, C, D) are **correctly** identified :-



	A	B	C	D
(1)	Female Thallus	Archegoniophore	Gemma cup	Rhizoids
(2)	Male Thallus	Antheridiophore	Gemma cup	Rhizoids
(3)	Female Thallus	Antheridiophore	Rhizoids	Gemma cup
(4)	Male Thallus	Archegoniophore	Rhizoids	Gemma cup

- Identify the following figure and its structure 'A' and 'B' :-

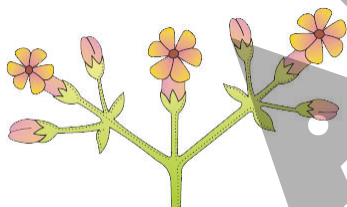


- (1) *Funaria*, A-Gametophyte ; B-Sporophyte
(2) *Sphagnum*, A-Sporophyte ; B-Gametophyte
(3) *Funaria*, A-Sporophyte ; B-Gametophyte
(4) *Salvinia*, A-Gametophyte ; B-Sporophyte
- Arrange the following events in **correct** sequence regarding life cycle of a fern :-
(A) Spore dispersal (B) Fertilization
(C) Zygote (D) Embryo
(E) Prothallus
(1) A,E,B,C,D (2) E,D,B,A,C
(3) B,D,C,E,A (4) E,C,D,B,A
- Small heart-shaped gametophyte called prothallus is part of the life cycle of the :-
(1) Liver worts (2) Ferns
(3) Mosses (4) Cycads
- A plant having vascular tissue, producing spores but lacking seed is a :-
(1) Bryophyte (2) Pteridophyte
(3) Gymnosperm (4) Angiosperm
- The heterosporous pteridophytes are :-
(1) *Lycopodium* and *Pteris*
(2) *Selaginella* and *Psilotum*
(3) *Selaginella* and *Salvinia*
(4) *Dryopteris* and *Adiantum*
- Both Gametophytes and sporophytes are independent in :-
(1) Gymnosperms
(2) Angiosperms
(3) Bryophytes
(4) Pteridophytes
- A gymnospermic leaf has 16 chromosomes. The number of chromosomes in its endosperm is:-
(1) 24 (2) 16 (3) 12 (4) 8
- Which statement is not correct about *Cycas* ?
(1) *Cycas* has small specialised roots called coralloid roots which are associated with N_2 -fixing cyanobacteria.
(2) It is a heterosporous plant
(3) The male cones & female cones are borne on same tree.
(4) Male & Female gametophytes are not free living.

12. Choose the **incorrect** statement regarding gymnosperms :-
- (1) They are heterosporous
 - (2) Male gametophytic generation is confined to only a limited number of cells, such reduced male gametophyte is called pollen grain
 - (3) The multicellular female gametophyte is retained within ovule
 - (4) Both male and female gametophytes are free living
13. What is common in between *Cycas* and *Pinus*?
- (1) Both are cryptogames
 - (2) Both are embryophytes
 - (3) Both having chloroplast with pyrenoids
 - (4) They require water for fertilisation
14. Which of the following pair is **correctly** matched ?
- (1) *Cycas* - Mycorrhiza
 - (2) *Pinus* - Coralloid roots
 - (3) *Cycas* - Coralloid roots
 - (4) *Pinus* - Triploid endosperm
15. Some statements are given below :-
- (a) In gymnosperm the male and the female gametophytes do not have an independent free-living existence
 - (b) In *Cycas* foliage leaves are pinnately compound
 - (c) The stems are branched in *Pinus* and *Cedrus*
 - (d) In *Pinus*, male cones and female cones are borne on different trees.
- Out of them, which statements are correct ?
- (1) a, b only
 - (2) a, b, c only
 - (3) c, d only
 - (4) a, b, c, d

MORPHOLOGY OF FLOWERING PLANT # 01
(The Root to The Inflorescence)

- Read the following five statements (A–E)
(A) Sheathing leaf base is found in monocotyledons
(B) In some leguminous plants, the leaf base may become swollen, which is called pulvinus.
(C) A bud is present in the axil of leaflets of the compound leaf.
(D) Palmately compound leaves are found in neem.
(E) Whorled phyllotaxy is found in *Alstonia*.
How many of the above statements are correct?
(1) Four (2) One
(3) Two (4) Three
- Which of the following is an example of modified adventitious root ?
(1) Carrot
(2) Radish
(3) *Asparagus*
(4) *Rhizophora*
- Identify the given below diagram and choose correct option :-



- (1) Monochasial cyme
(2) Dichasial cyme
(3) Cyathium inflorescence
(4) Polychasial cyme
- Which one of the following pair is correctly matched ?
(1) Horizontal underground stem – Corm
(2) Aquatic runner (Offset) – *Pistia*
(3) Stolon – Pineapple
(4) Phylloclade – *Australian acacia*
- A lateral branch with short internodes and each node bearing a rosette of leaves and tuft of roots found in aquatic plants is called :-
(1) Runner (2) Stolon (3) Offset (4) Sucker

- Which of the following pair is not correct ?

Column-I		Column-II	
(1)	Stem tendril	(a)	Grapes
(2)	Leaf bladder	(b)	Ber
(3)	Leaf tendril	(c)	Pea
(4)	Phyllode	(d)	<i>Australian acacia</i>

- The main functions of the root systems are
(a) Absorption of water & minerals
(b) Providing a proper anchorage to the plant
(c) Maintaining the temperature & pressure of the plant
(d) Gaseous exchange
Options :-
(1) a & b (2) c & d
(3) a & c (4) b & d
- Modified tap roots are found in :-
(1) Carrot & Sweet potato
(2) Turnip & Sweet potato
(3) Carrot & Turnip
(4) Sweet potato & Potato
- Leaf base may bear two small leaf like structures on lateral sides. These structures are called :-
(1) Bracts (2) Stipules
(3) Bracteoles (4) Perianth
- Palmately compound leaves are found in :-
(1) Neem (2) Silk cotton
(3) Mango (4) Peepal
- In which plants leaves are small, compound, short lived & petioles expand and become green to synthesise food.
(1) Pitcher plants (2) Bladder worts
(3) *Australian Acacia* (4) Venus fly trap
- Corm is a modification of –
(1) Root (2) Leaves
(3) Stem (4) Seed
- Which pair is wrong?
(1) Tuber – Potato
(2) Rhizome – Ginger
(3) Bulb – Onion
(4) Corm – Mint

14. Arrangement of flowers in racemose and cymose inflorescence are respectively –
- (1) Basipetal, Basipetal
 - (2) Basipetal, Acropetal
 - (3) Acropetal, Basipetal
 - (4) Acropetal, Acropetal
15. A racemose type of inflorescence in which flowers are pedicellate :-
- (1) Raceme (2) Spike
 - (3) Catkin (4) Spadix

Tg: @Chalnaayaaar

MORPHOLOGY OF FLOWERING PLANT # 02
(The Flower to Families of angiosperms)

1. Read the following four statements (A–D) :
- (A) Zygomorphic flowers are found in members of fabaceae.
(B) Monoadelphous stamens are found in members of fabaceae.
(C) Papilionaceous corolla is found in members of fabaceae.
(D) Inferior ovary is found in members of fabaceae.

How many of the above statements are wrong?

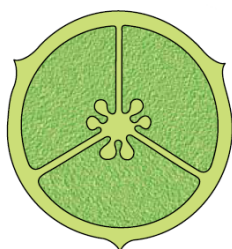
(1) Four (2) One (3) Two (4) Three

2. Read the following four statements (A–D)
- (A) Cymose inflorescence is found in *Solanum*.
(B) Valvate aestivation in petals is found in members of Solanaceae.
(C) Epiphyllous stamens are found in members of Solanaceae.
(D) Swollen placenta is found in members of Solanaceae.

How many of the above statements are correct?

(1) Four (2) One
(3) Two (4) Three

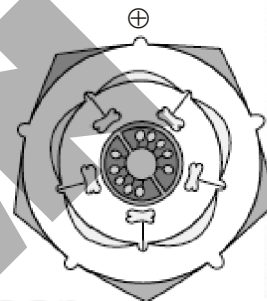
3. The fleshy fruits with hard and stony endocarp are called :-
- (1) Drupe (2) Berry
(3) Pepo (4) Pome
4. A diagnostic feature for identification of pea flower is :-
- (1) Tetradynamous stamens
(2) Inferior ovary
(3) Cruciform corolla
(4) Vexillary aestivation in petals
5. Identify the placentation shown below as well as related plants of its occurrence and select the right option for the two together :-



Options :-

	Placentation	Plants
(1)	Marginal	Pea and bean
(2)	Parietal	Argemone and mustard
(3)	Axile	Tomato and lemon
(4)	Basal	Sunflower and marigold

6. Identify the floral diagram shown below as well as related plant of its occurrence and select the right option for the two together ?



Options :-

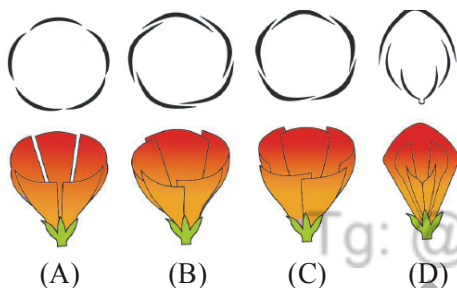
	Family	Plant
(1)	Liliaceae	Onion
(2)	Cruciferae	Mustard
(3)	Fabaceae	Pea
(4)	Solanaceae	Makoi

7. Consider the following four statements (a-d) and select the option which includes all the correct ones only :-
- (a) In members of fabaceae, flowers are actinomorphic.
(b) In members of fabaceae and liliaceae, ovary is inferior.
(c) In members of liliaceae, leaves are ex-stipulate.
(d) In members of liliaceae and solanaceae, placentation is axile.

Options :-

- (1) Statements (b), (c) and (d)
(2) Statements (a), (b)
(3) Statements (c), (d)
(4) Statements (a), (c) and (d)

8. Variation in the length of filaments within a flower occurs in :-
 (1) *Salvia* & Tomato (2) *Salvia* & Mustard
 (3) Mustard & Potato (4) Mustard & Tomato
9. Axile placentation is found in :-
 (1) *Argemone* & Mustard
 (2) *Dianthus* & *Primrose*
 (3) China rose & Tomato
 (4) Sunflower & Marigold
10. Imbricate aestivation is found in petals of :-
 (1) *Cassia* & Gulmohar
 (2) Pea & Bean
 (3) China rose & cotton
 (4) *Calotropis* & *pea*
11. Select the correct option in which given types of aestivation (A to D) are correctly identified with their suitable examples.



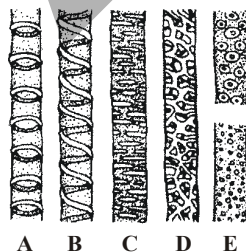
- (1) A-Valvate, Cotton; B-Imbricate, *Calotropis*;
 C-Twisted, *Cassia*; D-Vexillary, Pea
- (2) A-Valvate, *Calotropis*; B-Twisted, Cotton;
 C-Imbricate, *Cassia*; D-Vexillary, Pea
- (3) A-Vexillary, Pea; B-Twisted, Cotton;
 C-Imbricate, *Cassia*; D-Valvate, *Calotropis*
- (4) A-Twisted, Cotton; B-Valvate, *Calotropis*;
 C-Vexillary, *Cassia*; D-Imbricate, Pea

12. Syconus fruits are developed from :-
 (1) Spike inflorescence
 (2) Spadix inflorescence
 (3) Catkin inflorescence
 (4) Hypanthodium inflorescence
13. Tetrastynamous condition of stamens is found in :-
 (1) *Salvia* (2) Mustard
 (3) Lily (4) Tulsi
14. In litchi, type of fruit & edible part are, respectively:-
 (1) Pome, Thalamus
 (2) Pepo, Mesocarp
 (3) Nut, Aril
 (4) Pome, Aril
15. Choose wrong pair –
 (1) Mango – Drupe fruit
 (2) Musk melon – Pepo fruit
 (3) Brinjal – Berry fruit
 (4) Rice – Pome fruit

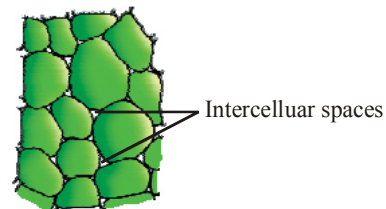
ANATOMY OF FLOWERING PLANTS # 01

(The Meristem to The Tissue System)

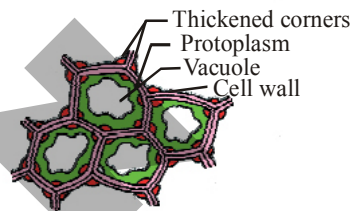
- Which meristems appear early in the life of a plant & contribute to the formation of the primary plant body :-
 (1) Apical meristem & interfascicular cambium
 (2) Apical meristem & cork cambium
 (3) Intercalary meristem & cork cambium
 (4) Intercalary meristem & apical meristem
- The meristem that occurs in the mature regions of roots & shoots of many plants, particularly those that produce woody axis is called :-
 (1) Apical meristem
 (2) Lateral meristem
 (3) Intercalary meristem
 (4) Primary meristem
- Which tissue forms the major component within organs :-
 (1) Parenchyma (2) Collenchyma
 (3) Sclerenchyma (4) Meristem
- Which one of the following is an example of primary lateral meristem ?
 (1) Phellogen
 (2) Interfascicular cambium
 (3) Intercalary meristem
 (4) Intrafascicular cambium
- Axillary buds are derived from
 (1) Intercalary meristem
 (2) Shoot apical meristem
 (3) Lateral meristem
 (4) Intrafascicular cambium
- The given diagrams show the types of thickenings in the xylem vessels. Identify the types labelled from A to E. Choose the correct option from given below in which A to E are correctly identified:
 (1) A = Spiral, B = Annular, C – Reticulated, D = Scalariform, E = Pitted
 (2) A = Annular, B = Scalariform, C = Reticulated, D = Spiral, E = Pitted
 (3) A = Annular, B = Spiral, C – Scalariform, D = Reticulated, E = Pitted
 (4) A = Spiral, B = Pitted, C = Scalariform, D = Reticulated, E = Annular



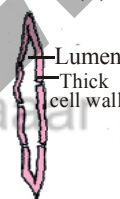
- The four diagrams (A, B, C and D) given below represents four different types of plant tissues or cell. Which one of these is correctly identified in the options given, along with its correct location and function ?



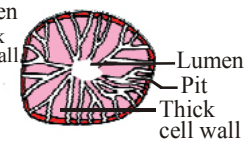
(A)



(B)



(C)



(D)

		Tissue	Location	Function
(1)	(D)	Collenchyma	Hypodermis of dicot stem	Mechanical strength
(2)	(A)	Parenchyma	Pith and cortex of root	Storage of food
(3)	(B)	Sclerenchyma	Hypodermis of sunflower stem	Mechanical support
(4)	(C)	Sclereid	Pulp of fruits	Provide hardness

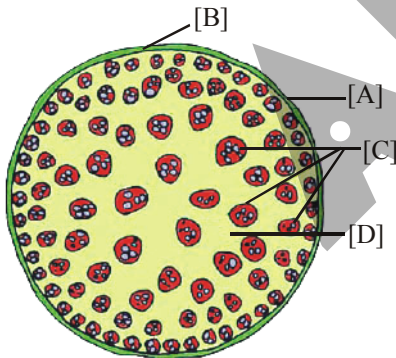
- Which one of the following simple tissue composed of more or less elongated cells with primary, non-lignified cell walls and their cell wall is unevenly thickened due to localised deposition of pectin, cellulose and hemicellulose :-
 (1) Sclerenchyma (2) Parenchyma
 (3) Collenchyma (4) Both (2) & (3)

9. Which one of the following are generally absent in primary phloem but are found in the secondary phloem ?
 (1) Phloem parenchyma
 (2) Phloem fibres
 (3) Sieve cells
 (4) Xylem parenchyma
10. Stomata, trichomes and root hairs are included in :-
 (1) Epidermal tissue system
 (2) Ground tissue system
 (3) Vascular tissue system
 (4) Fundamental tissue system
11. Both apical meristem and intercalary meristems are primary meristems because -
 (1) They are responsible for producing secondary tissues.
 (2) They are responsible for producing secondary meristems.
 (3) They appear early in life of a plant and contribute to the formation of the primary plant body.
 (4) They are generally cylindrical
12. Sclereids are found in -
 (1) The fruit walls of nuts
 (2) The pulp of fruits like guava, pear and sapota
 (3) Seed coats of legumes and leaves of tea
 (4) All of the above
13. In roots, the primary xylem is called exarch. because -
 (1) The protoxylem lies towards the centre and the metaxylem lies towards the periphery
 (2) The protoxylem lies towards the periphery and the metaxylem lies towards the centre
 (3) Both the protoxylem and the metaxylem lies towards the centre
 (4) The protoxylem is surrounded by the metaxylem.
14. Select true statements -
 (A) Jute, flax and hemp are commercial fibres
 (B) Cuticle is absent on epidermis of roots
 (C) The trichomes in the shoot system are usually multicellular.
 (1) Only B and C (2) Only A and C
 (3) Only A and B (4) All A, B and C
15. Select false statement -
 (1) In leaves, the ground tissue consists of thin walled chloroplast containing cells, called mesophyll
 (2) The stomatal aperture, guard cells and the surrounding subsidiary cells are together called stomatal apparatus
 (3) The root hairs are unicellular elongation of the epidermal cells.
 (4) The protophloem has bigger sieve tubes whereas metaphloem has narrow sieve tubes.

ANATOMY OF FLOWERING PLANTS # 02

(Primary Internal structure of root, stem & leaves to Secondary Growth)

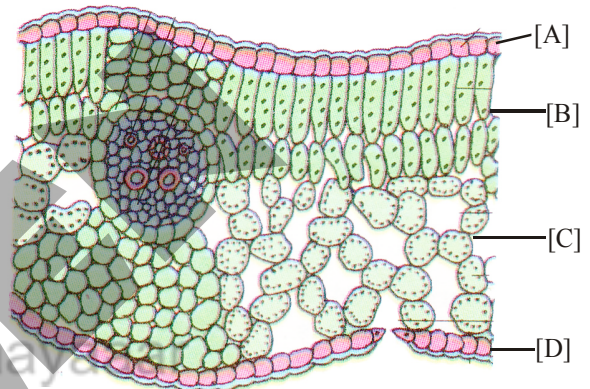
- The cross section of a plant material shows the following anatomical features under microscope:-
The vascular bundles are radially arranged, more than six xylem strands with exarch condition and well developed pith.
The plant material should be :-
(1) Dicot stem (2) Monocot stem
(3) Dicot root (4) Monocot root
- The transverse section of a plant material shows the following anatomical features under microscope:- Sclerenchymatous hypodermis, scattered vascular bundles in ground tissue, peripheral vascular bundles are generally smaller than the centrally located ones. Vascular bundles are conjoint, collateral and closed and phloem parenchyma is absent.
The plant material should be :-
(1) Dicot root (2) Dicot stem
(3) Monocot root (4) Monocot stem
- Given below is the diagrammatic view of T.S. of monocot stem. Identify the parts labelled A, B, C and D and select the right option about them



Options

	Part A	Part B	Part C	Part D
(1)	Epidermis	Hypodermis	Ground tissue	Vascular bundles
(2)	Epidermis	Hypodermis	Vascular bundles	Ground tissue
(3)	Hypodermis	Epidermis	Ground tissue	Vascular bundles
(4)	Hypodermis	Ground tissue	Epidermis	Vascular bundles

- Each vascular bundle is surrounded by sclerenchymatous bundle sheath in :-
(1) Sunflower root
(2) Maize stem
(3) Sunflower stem
(4) Maize root
- Given below is the diagrammatic view of transverse section of a dorsiventral leaf. Identify the parts labelled A, B, C and D and select the right option about them :-



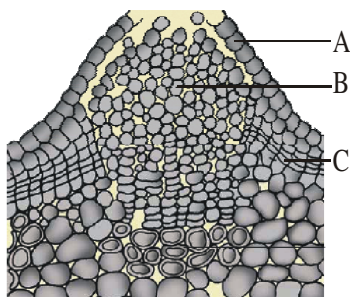
Options

	Part-A	Part-B	Part-C	Part-D
(1)	Abaxial Epidermis	Spongy Mesophyll	Palisade Mesophyll	Adaxial Epidermis
(2)	Abaxial Epidermis	Palisade Mesophyll	Spongy Mesophyll	Adaxial Epidermis
(3)	Adaxial Epidermis	Palisade Mesophyll	Spongy Mesophyll	Abaxial Epidermis
(4)	Adaxial Epidermis	Spongy Mesophyll	Palisade Mesophyll	Abaxial Epidermis

- In the vascular bundles of dorsiventral and isobilateral leaves, protoxylem and protophloem are, respectively situated towards—
(1) The adaxial and abaxial surface
(2) The abaxial and adaxial surface
(3) The lower and upper surface
(4) The lower surface only

7. When secondary growth is initiated in a dicot root then which of the following happens first—
- (1) Cambia initials between xylem and phloem of conjoint bundle divide
 - (2) Pericycle outside the primary xylem divide
 - (3) Periclinal division take place so that the cork cambium becomes circular
 - (4) Parenchymatous cells between xylem and phloem become meristematic

8. A, B and C in the given diagram are :-



- (1) A-Cork cambium, B-Complimentary cells, C-Epidermis
 - (2) A-Cork cambium, B-Secondary cortex, C-Complementary cells
 - (3) A-Epidermis, B-Complimentary cells, C-Cork cambium
 - (4) A-Epidermis, B-Complimentary cells, C-Secondary cortex
9. Heartwood is characterised by all, except :-
- (1) Presence of tyloses
 - (2) Active in water conduction
 - (3) Presence of dead and non-conducting elements
 - (4) Presence of tannins, resins, oils, gum etc.
10. In dicotyledonous stem, endodermis is also referred to as the starch sheath, because -
- (1) Its cells are rich in protein granules.
 - (2) Its cells are rich in starch grains.
 - (3) Its cells are rich in tannins
 - (4) Its cells are rich in oil droplets.

11. In a T.S of sunflower root, which sequence is correct from inner to outer side.

- (1) Endodermis → pericycle → cortex → epiblema
- (2) Pericycle → endodermis → cortex → epiblema
- (3) Epiblema → cortex → endodermis → pericycle
- (4) Cortex → Epiblema → pericycle → endodermis

12. The spring wood is ...'A'... in colour and has a ...'B'... density, whereas the autumn wood is ...'C'... in colour and has a ...'D'... density. In above paragraph, A, B, C and D are, respectively.

- (1) Lighter, lower, darker, higher
- (2) Lighter, higher, darker, lower
- (3) Darker, lower, lighter, higher
- (4) Darker, higher, lighter, lower.

13. Complimentary cells are :-

- (1) Collenchymatous (2) Parenchymatous
- (3) Sclerenchymatous (4) Meristematic

14. The cork is impervious to water -

- (1) Due to hemicellulose deposition in the cell wall.
- (2) Due to cellulose deposition in the cell wall.
- (3) Due to suberin deposition in the cell wall.
- (4) Due to pectin deposition in the cell wall.

15. Vascular rays (Secondary medullary rays) are formed by the activity of -

- (1) Fusiform initials
- (2) Ray initials
- (3) Phellogen
- (4) Apical meristem

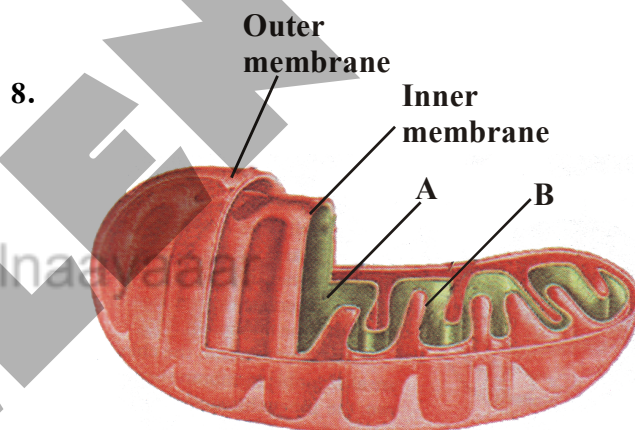
CELL : THE UNIT OF LIFE # 01

- Due to the absence of which of the following cell organelles, both prokaryotic and plant cells are differ from an animal cell ?
(1) 80 s ribosomes (2) Mesosome
(3) Centrioles (4) 70 s ribosomes
- Which of the following is / are found in both prokaryotic and eukaryotic cells ?
(A) Semi fluid matrix cytoplasm
(B) Selectively permeable plasma membrane
(C) 70 S ribosomes
(D) Membrane bound nucleus
(E) Genetic material DNA
(F) Chromatophores

Options :-

- (1) A, B, C and D (2) A, B, D and E
(3) B, D, E and F (4) A, B, C and E
- Substance 'A' is a polar molecule with higher concentration inside the cell than outside. How might this substance enter the cell ?
(1) By active transport
(2) By osmosis
(3) By diffusion without membrane protein
(4) By diffusion through membrane protein
- Which of the following layers of cell wall, is found closest to the plasma membrane in meristematic cells ?
(1) Middle lamella (2) Glycocalyx
(3) Secondary wall (4) Primary wall
- Materials to be packaged in the form of vesicles from the.....(i).....fuse with the.....(ii).....of the Golgi apparatus and move towards the....(iii)... Choose the correct terms for blanks :-
(1) (i) - lysosome, (ii) - maturing face, (iii)-trans face
(2) (i) - ER, (ii) - cis face, (iii) - forming face
(3) (i) - vacuole, (ii) - concave face, (iii) - convex face
(4) (i) - ER, (ii) - forming face, (iii) - trans face

- A cell makes proteins that are secreted from the cell which of the following might be the path of proteins within the cell ?
(1) Golgi body→ Rough ER→Plasma membrane
(2) Rough ER→ Golgibody→Plasma membrane
(3) Smoot ER → Golgi body→Plasma membrane
(4) Nucleus→ Rough ER → Lysosome
- Which of the following statements about lysosomes is **incorrect** ?
(1) They may be autolytic
(2) They are filled with acid hydrolases
(3) They can digest carbohydrates, lipids, proteins, nucleic acids
(4) They are monomorphic and uniform in structure and function



- Identify the above diagram
 - Label A and B
 - What is the function of B ?

Choose the correct combination of answers :-

 - (i) - Longitudinal section of mitochondrion
(ii) - (A) Intermembrane space
(B) - Matrix
(iii) - Protein synthesis
 - (i) - Transverse section of ER
(ii) - (A) - Ribosome , (B) - Cisternae
(iii) - Lipid synthesis
 - (i) - Longitudinal section of mitochondrion
(ii) - (A) - Matrix , (B) - Crista
(iii) - Increase in surface area
 - (i) - Golgi apparatus ,
(ii) (A) - vesicle , (B) - Tubule
(iii) packaging

9. Which of the following is not necessarily found in all living cells?
- (1) Cytoplasm
 - (2) Genetic material
 - (3) Mitochondria
 - (4) Plasma membrane
10. The stroma of chloroplast contains :-
- (a) enzymes for Krebs cycle.
 - (b) ribosomes similar in size and density to that of mitochondria.
 - (c) enzymes for dark reaction of photosynthesis.
 - (d) DNA similar to the nuclear DNA.
- Choose the **correct** :-
- (1) b and c
 - (2) a and d
 - (3) a and b
 - (4) b, c and d

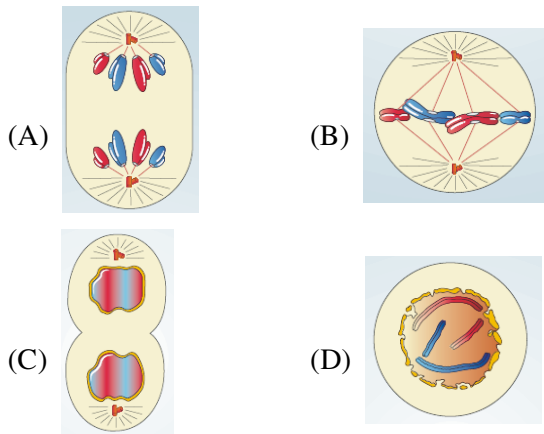
CELL : THE UNIT OF LIFE # 02

1. What is the difference of 'S' (Svedberg unit) between the large subunit of ribosomes on ER and small subunit of ribosomes in chloroplast?
 - (1) It is equal to the 'S' of small subunit of 80 S ribosome.
 - (2) It is equal to the half of the 'S' of small subunit of 70 S ribosome.
 - (3) It is equal to the half of the 'S' of large subunit of 80 S ribosome.
 - (4) It is equal to the 'S' of large subunit of 70 S ribosome.
2. Cytoskeleton in a cell is involved in many functions such as:-
 - (a) attachment to any surface.
 - (b) maintenance of the shape of the cell.
 - (c) control of transport across membrane.
 - (d) mechanical support.
 Which of the above are correct?
 - (1) a, b, c, d
 - (2) b, c, d
 - (3) only d
 - (4) b & d
3. Cilium or the flagellum are :-
 - (1) hair-like outgrowth of plasma-membrane
 - (2) not covered by any membrane as they originate from membraneless basal body.
 - (3) covered with double membrane like chloroplast.
 - (4) covered with amorphous pericentriolar material.
4. Membrane bound minute vesicles called microbodies, that contain various enzymes, are present:-
 - (1) in both plant and animal cells.
 - (2) only in plant cells.
 - (3) in both prokaryotic and eukaryotic cells.
 - (4) only in animal cells.
5. At a number of places the nuclear envelope is interrupted by minute pores which are formed by
 - (1) the fusion of its two membranes
 - (2) penetrating the envelope by protein channels
 - (3) placing a proton pump in the envelope
 - (4) passing of RNA and proteins through envelope
6. The interphase nucleus has :-
 - (1) Chromosomes, nucleolus and nuclear matrix.
 - (2) Chromatin, chromosomes and nucleolus.
 - (3) Chromatin, nucleoplasm and nucleolus.
 - (4) Chromosomes, chromatin and nucleoplasm.
7. Chromosome, with one extremely short and one very long arm, is called :-
 - (1) acrocentric
 - (2) telocentric
 - (3) metacentric
 - (4) sub-metacentric
8. Part of chromosome after the secondary constriction is known as :
 - (1) centromere
 - (2) kinetochore
 - (3) primary constriction
 - (4) satellite
9. Which of the following are used to define the karyotype of species?
 - (1) number of chromosomes.
 - (2) chromosome length.
 - (3) position of the centromere**Options :-**
 - (1) 1, 2 and 3 are correct.
 - (2) Only 1 and 2 are correct.
 - (3) Only 2 and 3 are correct.
 - (4) Only 1 and 3 are correct.
10. Salivary gland chromosomes are also known as :
 - (1) diplotene chromosomes
 - (2) leptotene chromosomes
 - (3) zygotene chromosomes
 - (4) polytene chromosomes

CELL CYCLE AND CELL DIVISION # 01

- In which of the following stages of cell cycle both cell growth and nuclear DNA replication occur ?
 (1) First Gap phase
 (2) Synthesis phase
 (3) Second Gap phase
 (4) Cell growth and nuclear DNA replication both are continuous processes during interphase
- Higher plants differ from animals in having-
 (1) Spindle fibres
 (2) Anastral mitosis
 (3) Kinetochores
 (4) Disappearance of nucleolus during prophase
- Four events A, B, C and D occurs during mitosis in the following sequence :
 $B \longrightarrow D \longrightarrow C \longrightarrow A$
 Choose the **correct match** for A, B, C and D from the following :-
 (i) Reformation of Nucleolus, ER and Golgibody
 (ii) Centromeres split
 (iii) Initiation of assembly of mitotic spindle
 (iv) Starting of furrow formation in the plasma membrane
Options :-
 (1) A-(i), B-(ii), C-(iii), D-(iv)
 (2) A -(iv), B-(iii), C-(ii), D-(i)
 (3) A-(i), B-(iii), C-(iv), D-(ii)
 (4) A-(iii), B-(i), C-(iv), D-(ii)
- Many cells in adult animals exit 'A' to enter an inactive stage called 'B' Cells in this stage remain metabolically 'C' and 'D'
 Choose the **correct** match :-
 (1) A = Karyokinesis, B = G_0 phase, C = inactive, D = divide
 (2) A = G_1 phase, B = G_0 phase, C = inactive, D = not divide
 (3) A = Cytokinesis, B = Polyteny, C = active, D = divide
 (4) A = G_1 phase, B = Quiescent stage, C = active, D = not divide
- In animal and plant cells the division of cytoplasm is respectively :-
 (1) Centripetal and centripetal
 (2) Centrifugal and centripetal
 (3) Centripetal and centrifugal
 (4) Centrifugal and centrifugal
- If in a cell the amount of DNA is $2C$ in G_2 phase then what will be the ratio of amount of DNA in metaphase : G_1 phase : Anaphase ?
 (1) 2 : 1 : 2
 (2) 1 : 2 : 2
 (3) 2 : 1 : 4
 (4) 1 : 1 : 2
- In an experiment, a human cell and a yeast cell divide simultaneously. After 48 hours what will be the ratio of number of cell cycles completed by yeast cell : Human cell ?
 (1) 32 : 1
 (2) 1 : 1
 (3) 16 : 1
 (4) 2 : 32
- A cell divides every minute. At this rate of division it can fill a 100 ml of beaker in one hour. How much time does it take to fill a 25 ml beaker?
 (1) 15 minutes
 (2) 30 minutes
 (3) 58 minutes
 (4) 29 minutes

9. Following are figure of phases of mitotic karyokinesis. Choose option regarding correct sequence of these phases in mitosis :-



Options :

- (1) A → B → C → D
- (2) D → B → A → C
- (3) D → C → B → A
- (4) B → A → D → C

10. Centrioles which had undergone duplication during ___A___ begins to move towards opposite poles of the cell in ___B___.

Choose the correct words for the blanks A and B from the following options :-

- (1) A = S phase, B = Metaphase
- (2) A = G₁ phase, B = Anaphase
- (3) A = G₂ phase, B = Anaphase
- (4) A = S phase, B = Prophase

Tg: @Chalnaayaaar

CELL CYCLE AND CELL DIVISION # 02

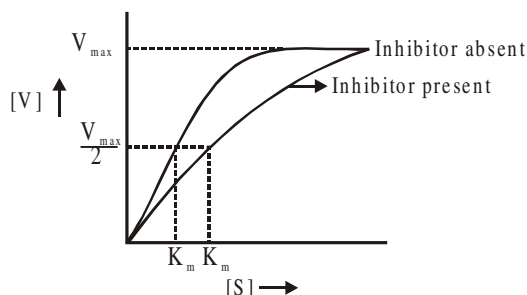
1. Prophase of the first meiotic division (Meiosis-I) is complex and is subdivided into ____ phases based on ____.
Choose correct terms for above blanks respectively :-
(1) four, size of chromosomes
(2) five, shape of chromosomes
(3) five, condensation of chromosomes
(4) five, chromosomal behaviour
2. _____ ensures the production of haploid phase in the life cycle of sexually reproducing organisms where as _____ restores the diploid phase.
Choose the **correct** terms for the blanks respectively:-
(1) Meiosis, Mitosis
(2) Meiosis, Fertilisation
(3) Fertilisation, Meiosis
(4) Mitosis, Meiosis
3. Equational division is differ from reductional division in **not having**-
(1) longer prophase than anaphase
(2) synapsis and crossing over
(3) duplication of DNA
(4) double chromatid chromosomes in metaphase
4. Exchange of segments between chromatids of chromosomes occurs during division.
(1) non sister, non homologous, reductional
(2) sister, homologous, equational
(3) non sister, homologous, equational
(4) non sister, homologous, reductional
5. In meiosis-I, a tetrad has-
(1) two chromatids, one centromere, one chromosome
(2) two chromatids, two centromeres, two chromosomes
(3) four chromatids, two centromeres, two chromosomes
(4) four chromatids, four centromeres, four chromosomes
6. Congression is a phenomenon of-
(1) pairing of homologous chromosomes
(2) separation of paired chromosomes
(3) movement of sister chromatids towards poles
(4) movement of chromosomes towards equator of cell
7. In which of the following phases, each chromosome is made up of two chromatids ?
(1) Prophase, Metaphase-II, Anaphase-I
(2) Prophase-I, Anaphase-II, Metaphase
(3) Telophase, Anaphase-I, Telophase-II
(4) Metaphase, Anaphase, Telophase-I
8. As compared to meiosis-I, meiosis-II has-
(1) long prophase
(2) doubling of chromosomes in anaphase
(3) exchange of chromatid segments
(4) reduction in number of chromosomes in daughter cells
9. If egg (female gamete) of an organism has 10 pg of DNA in its nucleus. How much DNA would a diploid cell of same organism has in G_2 phase of interphase ?
(1) 10 Pg (2) 20 Pg
(3) 5 Pg (4) 40 Pg
10. If in a cell 6 tetrad are present in prophase-I then what will be the number of chromatids in each cell in Anaphase-II ?
(1) 24 (2) 6 (3) 12 (4) 48

BIOMOLECULE - II (ENZYME)

1. Which of the following is not a correct statement for non-competitive irreversible inhibition of enzymes ?

- (1) $V_{\max}$ is decreased
- (2) K_m remains the same
- (3) ESI complex is formed
- (4) Inhibitor action can be overcome by increasing the substrate concentration

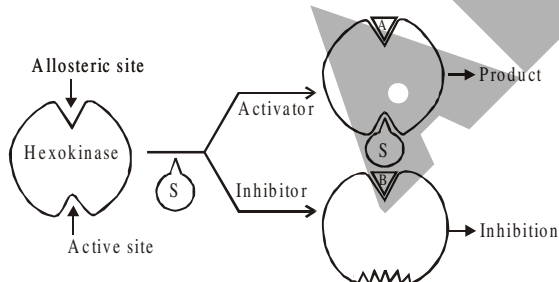
2.



In the following diagram inhibitor is :-

- (1) Competitive, reversible
- (2) Competitive, irreversible inhibitor
- (3) Non competitive, reversible inhibitor
- (4) Non competitive, irreversible inhibitor

3.



In the following digrametic representation A and B is respectively :-

- (1) $A \rightarrow G-6P$, $B \rightarrow ATP$
- (2) $A \rightarrow ADP$, $B \rightarrow G-6P$
- (3) $A \rightarrow Fructose\ 6P$, $B \rightarrow ATP$
- (4) $A \rightarrow ATP$, $B \rightarrow ADP$

4. (A) Metal ions are co-factor which form coordination bonds with side chains at the active site and at the same time form one or more coordination bonds with the substrate

(B) Co-enzymes are organic compounds and their association with the apoenzyme is permanent.

- (1) Both (A) and (B) are correct
- (2) Both (A) and (B) are incorrect
- (3) Only (A) is correct
- (4) Only (B) is correct

5. Read the following four statements (A–D) :-

(A) Thermal stability is an important quality of enzymes which are isolated from thermophilic organisms

(B) Formation of Enzyme-substrate complex, during enzymatic reaction is an optional phenomenon

(C) Enzymes bring down the activation energy

(D) The essential chemical components of many coenzymes are vitamins

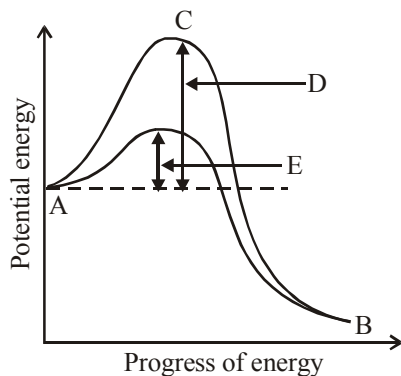
Choose the option which include all the correct statements :-

- (1) A, B, C
- (2) B, C, D
- (3) A, C, D
- (4) A, B, D

6. Which one is a typical example of feedback inhibition ?

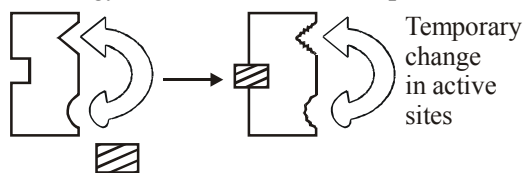
- (1) Allosteric inhibition of hexokinase by glucose-6-phosphate
- (2) Reaction between succinic dehydrogenase and succinic acid
- (3) Cyanide and cytochrome reaction
- (4) Sulpha drugs and folic acid synthesis

7.



- (1) Energy level of A is low as compared to B
- (2) Energy level of B is high as compared to C
- (3) Energy level of D is high as compared to E
- (4) Energy level of C is low as compared to A and B

8.



	Type of Inhibition	Characteristic
(1)	Competitive	It can be checked by increasing the concentration of substrate
(2)	Allosteric	K_m —No change
(3)	Non competitive	It can be checked by increasing the concentration of substrate
(4)	Irreversible	V_{max} — Decrease

9.

Column-I contains the graph for rate of reaction and column-II contain the four factor known to affect the rate of enzyme controlled reaction. Choose the correct match :

Column-I

Column-II



(i) pH



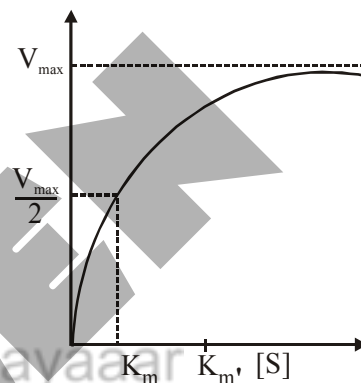
(ii) Temperature

(iii) Product concentration

(iv) Substrate concentration

- (1) (a) i, ii, (b) iii, iv
- (2) (a) ii, iii, (b) i, iv
- (3) (a) i, ii, (b) iv
- (4) (a) i, iii, (b) i, ii

10.



Above graph is showing the effect of substrate concentration (S) on enzymatic activity. If due to change in enzymatic activity K_m value changes to K_m' , then which of the following can be conclude on the basis of this change?

- (1) There is a significant increase in enzymatic activity
- (2) Entry of positive allosteric modulator in enzymatic activity
- (3) Entry of non competitive inhibitor in enzymatic activity
- (4) In enzymatic activity, entry of inhibitor which closely resembles the substrate in its molecular structure

TRANSPORT IN PLANTS # 01

- Uphill transport
 - Against the concentration gradient
 - ATP independent
 - Transport saturates
 - Independent from living system
 - Net transport of molecules takes place according to concentration gradient

Which of the above given features is/are concerned with the process that is only means of gaseous exchange in plants ?

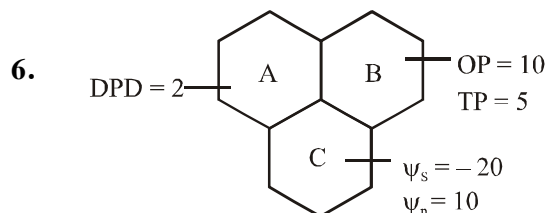
 - i, ii & iii
 - ii, iv & vi
 - vi only
 - iii, v and vi
- Factors affecting simple diffusion is/are :-

 - concentration gradient
 - permeability of membrane
 - temperature
 - all of the above
- Which of the following transport methods show hormonal regulation but not required ATP?

 - simple diffusion
 - active transport
 - facilitated diffusion
 - simple diffusion and facilitated diffusion
- Which of the following transport methods show transport saturation and uphill transport both?

 - simple diffusion
 - active transport
 - facilitated diffusion
 - simple diffusion and facilitated diffusion
- Two solutions A and B, with different amount of solute and solvent are separated through membrane, after some time it was observed that both A & B have same amount of solute & solvent means they separated via :-

 - semi-permeable membrane
 - impermeable membrane
 - permeable membrane
 - parchment membrane



Which statement is **incorrect** with respect to given diagram ?

- Cell A and C has maximum and minimum ψ_w respectively
 - Flow of solvent can take place from B $\rightarrow$ C
 - Cell A has fewer free water than cell B
 - The value of TP of cell C is 10
7. Select the **correct** one with respect to flaccid cell :-
- DPD = 0
 - DPD = OP
 - TP = DPD
 - OP = TP
- 8.
-
- A = Hypertonic solution
B = Living cell
- Which one of the following is **correct** for above given diagram ?
- Solute potential of B is higher than A
 - Solute potential value is more negative for A than B
 - Water potential value is more negative for A than B
 - All of these
9. Higher concentration of sugar in jams and jellies stops the growth of bacteria and fungi. Phenomenon involved in this process is :-
- inhibition
 - plasmolysis
 - transpiration
 - root pressure
10. Imbibition is :
- a facilitated diffusion
 - an osmosis
 - an active transport
 - a diffusion

TRANSPORT IN PLANTS # 02

- "Transpiration is a necessary evil"
Above statement was given by :-
(1) Curtis (2) Levitt
(3) Steward (4) Fujino
- Guard cells are considered as modified epidermal cells in the respect of :-
(i) Elastic inner wall
(ii) Possess chloroplast
(iii) Radially arranged microfibrils in cell wall
(iv) Differential thickening of walls
(v) Lack of nucleus
(vi) Non-living
Select **correct** option :-
(1) i, ii, iii (2) ii, iii, vi
(3) i, ii, iii, iv (4) All of these
- The immediate cause of the opening of the stomata is :-
(1) increase in TP of guard cells
(2) decrease in TP of guard cells
(3) increase in TP of subsidiary cells
(4) endosmosis in subsidiary cells
- How many substances in the list given below are useful in dry farming?
Phenyl mercuric acetate, salicylic acid, oxyethylene, wax, ABA, CO₂.
(1) six (2) five
(3) four (4) three
- Which statement is **true** with respect to symplastic movement of water ?
(1) Movement is relatively faster than apoplastic one
(2) Involve most of the water flow in plants
(3) Down a potential gradient
(4) Not requires crossing of cell membrane
- Which one of the following is an **incorrect** statement ?
(1) Xylem transports only inorganic nutrients and phloem transports only organic materials
(2) The direction of movement in the phloem can be upward or downward

- Pressure potential (ψ_p) of flaccid cell is zero.
- Transport proteins of root endodermal cells are not only adjust the quantity but also the type of solute that reach the xylem.

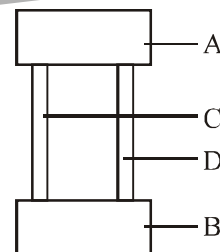
7. Match the Column-I and Column-II and select the **correct** option :-

- | | |
|----------------------|--|
| (a) Imbibition | (i) Positive pressure |
| (b) Active transport | (ii) Exosmosis |
| (c) Plasmolysis | (iii) Against the concentration gradient |
| (d) Root pressure | (iv) Along concentration gradient |

Options :-

- | | |
|----------------------------|----------------------------|
| (1) a-i, b-ii, c-iii, d-iv | (2) a-ii, b-iv, c-iii, d-i |
| (3) a-iii, b-iv, c-i, d-ii | (4) a-iv, b-iii, c-ii, d-i |

8. A = Bud
B = Root
C = Sieve tube
D = Vessel



Above diagram representing the translocation of food in plants in early spring.

Find the **correct** option for translocation of food :-

- | | |
|----------------------|----------------------|
| (1) A to B through C | (2) B to A through C |
| (3) A to B through D | (4) B to A through D |
9. Phloem sap is consist of :-
(1) Water and sucrose only
(2) Water, sucrose, hormone and amino acid
(3) Sucrose & amino-acid only
(4) Water, glucose and amino-acid
10. Find the **wrongly match** pair :-
(1) Guttation – Loss of impure water
(2) Transpiration pull – Account for the majority of water transport
(3) Girdling – Phloem is responsible for translocation of food
(4) Unloading of minerals – Through active transport at the fine vein endings

MINERAL NUTRITION

1. Out of the more than 105 elements discovered so far, how many are essential and beneficial for normal plant growth and development ?
 - (1) 21 elements
 - (2) 11 elements
 - (3) Less than 17 elements
 - (4) More than 21 elements
2. A - In hydroponics technique defined nutrient solution is used.
B - Hydroponics technique helps the scientists to identify essential elements.
Select the correct option :-
 - (1) Both A and B are correct
 - (2) A is correct but B is incorrect
 - (3) A is incorrect but B is correct
 - (4) Both A and B are incorrect
3.
 - (i) In the absence of the element the plants do not complete their life cycle or set the seeds.
 - (ii) Deficiency of any one element can not be meet by supplying some other element.
 - (iii) The element must be directly involved in the metabolism of the plant.

Select the number of elements from the given box which does not full-fill the above given criteria but are beneficial elements for higher plants :-

N, Cl, Mg, P, K, Ni, As, Mn

C, Na, Si, Cu, Cd, Al, Se

- (1) 4 (2) 8 (3) 5 (4) 3

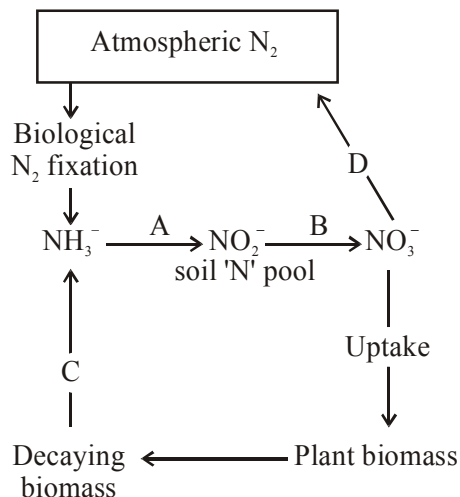
4. Below critical concentration of minerals, plants show :-
- (1) Toxicity symptoms
 - (2) Deficiency symptoms
 - (3) Neither toxicity nor deficiency symptoms
 - (4) It depends on the role of minerals in plants
5. Deficiency of which element causes khaira disease of rice ?
- (1) Zinc
 - (2) Iron
 - (3) Sulphur
 - (4) Nitrogen
6. Select **incorrect** match with respect to mineral and the function :-
- (1) Zinc – Synthesis of auxin
 - (2) Chlorine – Cation- anion balance
 - (3) Copper – Activator of alcohol dehydrogenase
 - (4) Molybdenum – Nitrogen metabolism
7. Find the **correct** one :-
- (1) Necrosis - Cause only by macronutrients
 - (2) Toxic concentration - increases the dry weight of tissue by about 10%
 - (3) Manganese - Evolution of O_2 in photosynthesis
 - (4) *Nitrobacter* - N_2 fixation
- 8.

	Elements	Concentration	Symptoms
i	Ca, Mg, Cu, K	At critical concentration	Necrosis
ii	N,K,S,Mo	Above critical concentration	Inhibition of cell division
iii	N,K,S	less than 10 m mole per kg dry weight	No symptoms
iv	N,K,Mg	Below critical concentration	Chlorosis

Which of the following is/are **correct** combination(s) ?

- (1) i, ii & iii (2) ii & iii
(3) Only iv (4) Only iii

9.



Find the **correct match** for A, B, C and D in above given diagram :-

- (1) A = Free-living bacteria
B = N_2 fixing bacteria
C = Saprophytic bacteria
D = Soil microbes
- (2) A = Free-living bacteria
B = Chemoautotrophic bacteria
C = Saprophytic bacteria
D = Reduction
- (3) A = *Nitrosomonas*
B = *Nitrobacter*
C = Chemoautotrophs
D = Soil microbes
- (4) A = *Nitrosomonas*
B = *Nitrobacter*
C = Symbiotic bacteria
D = Soil microbes

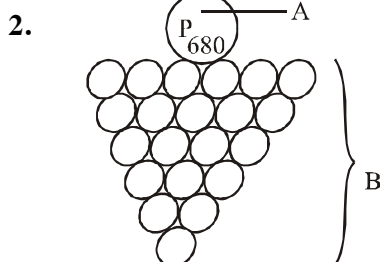
10. Select **incorrect** statement with respect to nitrogenase :-

- (1) Oxygen sensitive enzyme
- (2) Not present in prokaryotes
- (3) Involve in nitrogen fixation
- (4) Made up of Mo - Fe protein

PHOTOSYNTHESIS IN HIGHER PLANTS # 1

1. Which of the following statements is not correct?

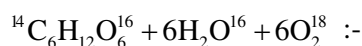
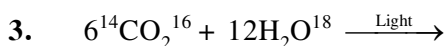
- (1) Moll's half leaf experiment shows that carbondioxide is required for photosynthesis
- (2) Jan ingenhousz showed that only the green part of the plants could release oxygen.
- (3) In high light intensity chloroplasts align their flat surfaces parallel to the lateral walls of mesophyll cells
- (4) Carbon reactions in photosynthesis are directly light driven reactions.



- (i) A is made up of chlorophyll a molecule
- (ii) B is made-up of hundreds of pigment molecule bound to protein
- (iii) Here B is the part of photosystem I
- (iv) B also contain chlorophyll a molecules
- (v) A can also made up of chlorophyll b molecule

Select the **correct** option with respect to above given diagram :

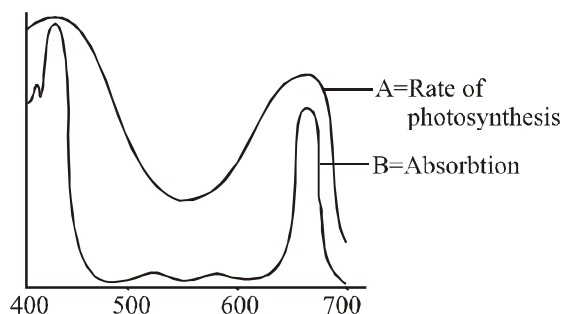
- (1) i, ii, iv
- (2) ii, iii, iv
- (3) i, ii, iv, v
- (4) All of above



Read the following statements with respect to given equation and find the statement which **can not** be explain from the equation

- (1) There are two steps involve in photosynthesis i.e. light reaction and dark reaction
- (2) CO_2 is the source of oxygen for both carbohydrate and water
- (3) Water is the source of O_2 released
- (4) Photosynthesis involves reduction of CO_2

4.



Find the statement which **can not** be conclude from the given diagram / graph :-

- (1) Absorption spectra is roughly overlapped by action spectra
- (2) Maximum evolution of O_2 will takes place where maximum absorption of light occur
- (3) Maximum photosynthesis occur in blue and red region
- (4) Water is a source of O_2 in photosynthesis

5.

Which of the following statement is **correct** with respect to non-cyclic photophosphorylation?

- (1) Light cause the splitting of water at stroma side of thylakoid membrane
- (2) e^- from first acceptor of PS-II to NADP^+ involve uphill movement in terms of redox potential scale
- (3) NADP^+ recieve e^- from donor which is having redox potential lower than NADP^+ .
- (4) Splitting of water lead to release of e^- from PS-II

6.

Photolysis of water means :-

- (1) oxidation of water
- (2) reduction of NADP^+
- (3) evolution of H_2 from plant
- (4) reduction of PS II

7.

Which of the following is **not** concerned with non-cyclic photophosphorylation ?

- (1) Photolysis of water
- (2) Evolution of O_2
- (3) Reduction of NAD^+
- (4) Formation of ATP

8. Which one of the following **will not** help in the creation of proton gradient for the ATP formation ?

- (1) Accumulation of protons in thylakoid lumen
- (2) Photolysis of water in thylakoid
- (3) Activation of NADP reductase
- (4) Decrease in acidic level in thylakoid lumen

9. Match column-I and column-II :-

(a)	OEC	(i)	Assimilatory power
(b)	ATP	(ii)	Splitting of water
(c)	LHC	(iii)	Reducing power
(d)	NADPH	(iv)	Both PS-I and PS-II

Select **correct** option :-

- (1) a-ii, b-iii, c-iv, d-i (2) a-iii, b-ii, c-iv, d-i
- (3) a-ii, b-i, c-iv, d-iii (4) a-iv, b-i, c-iii, d-ii

10. If a plant growing in the condition where only light of wavelengths beyond 680 nm are available then find **correct** option :-

- (i) No NADPH_2 formation
- (ii) e^- back to same reaction center
- (iii) Only PSII is active
- (iv) ATP formed
- (v) O_2 evolution takes-place

Options :-

- (1) iii & iv are correct
- (2) ii, iii & iv are correct
- (3) i, ii & iv are correct
- (4) iv & v are correct

PHOTOSYNTHESIS IN HIGHER PLANTS # 2

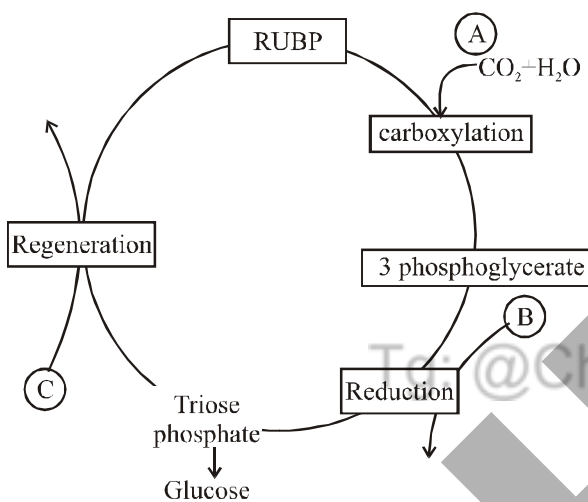
1. Match the Column-I and Column-II and select correct option :-

- | | |
|--------------------|---------------------------------------|
| (a) NADP reductase | (i) Stroma |
| (b) OEC | (ii) Inner side of thylakoid membrane |
| (c) ATPase | (iii) Stroma side of membrane |
| (d) RuBisCO | (iv) F_1 part |

Options :-

- | | |
|----------------------------|----------------------------|
| (1) a-i, b-iii, c-ii, d-iv | (2) a-i, b-iii, c-iv, d-ii |
| (3) a-iii, b-ii, c-iv, d-i | (4) a-iii, b-iv, c-ii, d-i |

2.



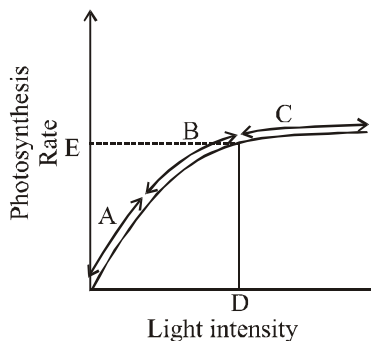
Find the **correct** option :-

- | |
|---------------------------|
| (1) A = 16 ATP & 12 NADPH |
| (2) B = 12 ATP & 12 NADPH |
| (3) B = 18 ATP & 12 NADPH |
| (4) C = 12 ATP & 6 NADPH |

3. How many ATP are required in regeneration steps of Hatch-Slack pathway (i.e. C_3 & C_4 cycle both) during the formation of 1 glucose ?
- | | |
|------------|------------|
| (1) 30 ATP | (2) 18 ATP |
| (3) 36 ATP | (4) 15 ATP |
4. Find the number of ATP required in reduction step of C_3 cycle if the cycle is involve in the formation of sucrose :-
- | | |
|------------|------------|
| (1) 12 ATP | (2) 24 ATP |
| (3) 18 ATP | (4) 6 ATP |
5. Find **odd** one out with respect to C_4 plants :-
- | | |
|-----------------|--------------------|
| (1) Maize | (2) <i>Sorghum</i> |
| (3) Bell pepper | (4) Sugarcane |

6. C_4 plants are **not** differ from C_3 plants :-
- (1) In the presence of oxalo acetic acid as a first stable product of dark reaction
 - (2) In Lack of photorespiration
 - (3) In using ATP and NADPH as assimilatory power in dark reaction
 - (4) In having Kranz anatomy
7. C_3 plants are differ from C_4 plants in :-
- (1) presence of RuBisCO in mesophyll cells
 - (2) presence of C_3 cycle
 - (3) presence of dimorphic chloroplasts
 - (4) formation of PGA in Calvin cycle
8. Which is **incorrect** statement with respect to RuBisCO enzyme ?
- (1) Most abundant enzyme in the world
 - (2) Bifunctional enzyme
 - (3) It is always present in the stroma of mesophyll cell's chloroplasts
 - (4) RuBisCO can catalyse both Calvin cycle as well as photorespiration
9. In C_4 plants photorespiration does not occur because :-
- (1) RuBisCO in C_4 plants lack oxygenase activity
 - (2) PEPcase is present in mesophyll cells.
 - (3) RuBisCO has a much greater affinity for CO_2 than O_2
 - (4) They have mechanism that increases the concentration of CO_2 at RuBisCO enzyme site
10. A- Photorespiration is absent in C_4 plants.
B- PEPcase is a 3 carbon containing primary CO_2 acceptor in C_4 plants
Select correct option :-
- (1) Both A & B are correct
 - (2) A is correct but B is incorrect
 - (3) A is incorrect but B is correct
 - (4) Both A & B are incorrect

11.



Select the **correct** option with respect to light as factor :-

- (1) A = Low light intensities
D = Compensation point
E = Saturation point
- (2) B = Saturation point
C = Compensation point
- (3) A = Low light intensities
C = Light is not a limiting factor
D = Saturation point
- (4) C = Compensation point
D = Law of limiting factor comes into effect

12. The effect of water as a factor is more through its effect on the plant, rather than directly on photosynthesis.

The above statement is justified by which of the following ?

- (1) Water stress causes the closing of stomata
- (2) Reduction in surface area of leaves due to wilting
- (3) Reduction in metabolic activities due to water deficiency
- (4) All of above

13. A - C_4 pathway is observe only in monocots
B - RuBisCO has much greater affinity for CO_2 than O_2
C - Tropical plants have a higher temperature optimum than the plants adapted to temperate climates.
D - Current availability of CO_2 levels is limiting to the C_4 plants

Select true and false statements from given options :-

- | | A | B | C | D |
|-----|-------|-------|-------|-------|
| (1) | False | True | True | False |
| (2) | True | True | False | False |
| (3) | True | False | True | False |
| (4) | False | True | False | True |

14. A plant is growing at light compensation point then find **correct** statement :-

- (1) At this time light can never be a limiting factor.
- (2) Catabolic breakdown of C-C bond in respiration is equal to anabolic synthesis of C-C bond in photosynthesis
- (3) Increase in CO_2 concentration can overcome the light compensation point
- (4) 10% of full sunlight is light compensation point

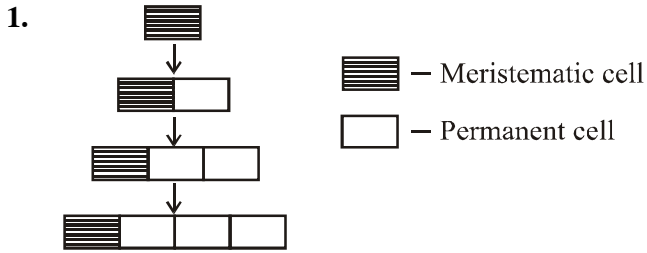
15. Select **correct** option with respect to factor and its effect on plants :-

	Factors	Effect on plants	
		C_3 plants	C_4 plants
1	Temperature 30 - 40°C	Photosynthesis increase	Photosynthesis decrease
2	CO_2 concentration 400-450 $\mu L L^{-1}$	Show CO_2 fertiliser effect	Not show CO_2 fertiliser effect
3	High O_2 concentration	Photosynthesis increase	Photosynthesis decrease
4	Light saturation	At 20% of full sun light	At more than 50% of full sunlight

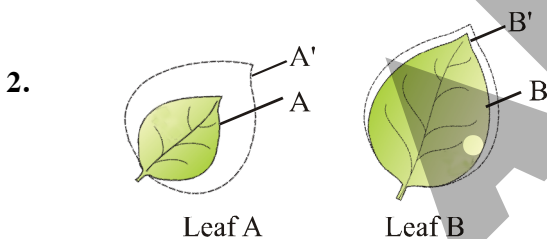
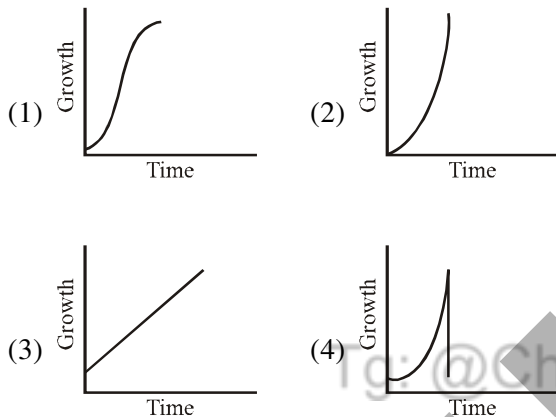
RESPIRATION IN PLANTS

- Anaerobic respiration is differ from aerobic respiration in the presence of :-
 (1) incomplete breaking of complex compound
 (2) phosphorylation at substrate level
 (3) a chain of 10 enzymatic reactions of glycolysis
 (4) redox reaction
- Which is **not** a character of aerobic respiration?
 (1) Final products are inorganic nature
 (2) May found in both prokaryotic and eukaryotic organisms
 (3) Very vigorous oxidation of NADH to NAD⁺
 (4) ETS is the final stage for the breaking of C-C bond
- Which enzyme of glycolysis controls the rate of reaction ?
 (1) Phosphofructokinase
 (2) Aldolase
 (3) Isomerase
 (4) Phosphoglyceraldehyde dehydrogenase
- In which step of aerobic respiration redox equivalents reaction takes place ?
 (1) Glycolysis
 (2) Link reaction and TCA cycle
 (3) ETS
 (4) All of these
- Which of the following steps does **not** involve decarboxylation reaction ?
 (1) 2 Phosphoglycerate → phosphoenol pyruvate
 (2) Pyruvic acid → Acetyl Co-A
 (3) Isocitric acid → α-ketoglutaric acid
 (4) α-ketoglutaric acid → succinyl Co-A
- Find the number of decarboxylation reactions take place with the oxidation of fructose in aerobic respiration ?
 (1) 6 (2) 18 (3) 20 (4) 25
- Which is **correct** statement with respect to ATP synthase ?
 (1) It involve in ATP synthesis at substrate level phosphorylation
 (2) It is present in outer membrane of mitochondria
 (3) It is involved in oxidative phosphorylation
 (4) The breakdown of proton gradient occurs after the activation of ATP synthase
- Which one of the following enzymes of TCA cycle is **not** present in matrix of mitochondria?
 (1) Succinate dehydrogenase
 (2) Cis-aconitase
 (3) Fumerase
 (4) Decarboxylase
- Each oxidative phosphorylation in ETS :-
 (1) increase the electrochemical proton gradient
 (2) decrease the electrochemical proton gradient
 (3) increase the pH of peri mitochondrial space
 (4) Both (2) & (3)
- Which e⁻ carrier of ETS is present on outer surface of inner membrane of mitochondria and mobile in nature ?
 (1) Cyt. b (2) PQ (3) Cyt. c (4) Cyt.a
- Find the number of ATP which are formed with the utilisation of 10 oxygen molecules in ETS with respect to NADH₂ oxidation :-
 (1) 30 (2) 40 (3) 50 (4) 60
- Their will be net gain of how many ATP through substrate level phosphorylation in aerobic respiration if the substrate is sucrose ?
 (1) 3 (2) 4 (3) 5 (4) 8
- Find the number of ATP by substrate level phosphorylation from the pathway of aerobic respiration in mitochondria which is common in breakdown of fat, protein and carbohydrate:-
 (1) 5 ATP (2) 3 ATP (3) 1 ATP (4) 4 ATP
- Which statement is **incorrect** with respect to fermentation ?
 (1) It involve the release of less than seven percent of energy of glucose
 (2) NADH is reoxidised into NAD⁺
 (3) It does not involve complete oxidation of end product of glycolysis
 (4) In alcoholic fermentation decarboxylation is followed by reduction of NAD⁺
- Which conclusion **can not** be drawn from the given options if the RQ value of plant is less than 1 at any given time ?
 (1) Respiratory substrate can be fat
 (2) Respiratory substrate can be protein
 (3) Amount of oxygen is less than the carbon in respiratory substrate
 (4) Pure proteins or fats can never used as respiratory substrates

PLANT GROWTH AND DEVELOPMENT



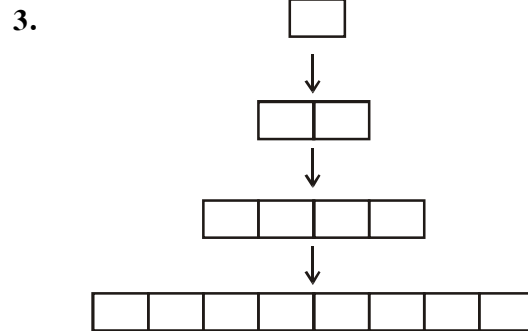
Which one of the following graphs is **correctly** represent the above growth pattern ?



Initial size of leaf A & leaf B was 10 cm^2 & 100 cm^2 respectively. Both leaves A & B are increased their area by 10 cm^2 in a given time to produce A' & B' leaves.

Select **incorrect** statement :-

- (1) Absolute growth in both leaves are equal
- (2) Relative growth in leaf B is higher than leaf 'A'
- (3) Leaf 'A' increases to double of its size
- (4) Growth rate in leaf B is 10%



Read the following statements with respect to above growth pattern :-

- (i) Each cell retain the ability to divide and continue to do so.
- (ii) Growth rate is constant throughout the time
- (iii) Growth rate is depend upon the size of population

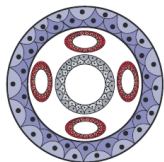
Select the correct option :-

- (1) i, ii & iii are correct
 - (2) ii & iii are correct
 - (3) ii & iii are incorrect
 - (4) Only (ii) is incorrect
4. Constant growth rate in root and shoot elongation can mathematically expressed as :-
- (1) $L_t = L_0 + rt$
 - (2) $W_t = W_0 e^{rt}$
 - (3) $L_t = L_0 + rt$
 - (4) $W_t = W_0 + e^{rt}$
5. Which one of the following is **not** a redifferentiated tissue ?
- (1) Cork
 - (2) Secondary cortex
 - (3) Secondary xylem
 - (4) Phellogen
6. Environmental heterophylly is observe in :-
- (1) cotton
 - (2) coriander
 - (3) *Larkspur*
 - (4) buttercup
7. Match column-I and column-II :-
- | | |
|-------------|-----------------------------------|
| a- Auxin | (i) overcome the apical dominance |
| b-Cytokinin | (ii) break seed and bud dormancy |
| c-Ethylene | (iii) closing of stomata |
| d-ABA | (iv) xylem differentiation |
- Options :-**
- (1) a-iv, b-i, c-ii, d-iii
 - (2) a-i, b-iv, c-ii, d-iii
 - (3) a-iv, b-i, c-iii, d-ii
 - (4) a-i, b-iii, c-ii, d-iv

8. From which fruit, Cousins confirmed the release of a volatile substance that hastened the ripening of stored unripened bananas ?
 (1) Ripened oranges (2) Unripened oranges
 (3) Ripened mangoes (4) Unripened mangoes
9. Which of the following plant growth regulators helping the plants to increase their absorption surface ?
 (1) ABA (2) Auxin
 (3) Ethylene (4) Gibberellin
10. ABA helps seeds to withstand desiccation and factors unfavourable for growth by inducing:-
 (1) Dormancy (2) Development
 (3) Maturation (4) Germination
11. Interruption of continuous light period by dark condition enhance flowering in a plant then the plant is :-
 (1) SDP (2) LDP
 (3) DNP (4) LDP or DNP
12. Which one of the following plant fail to show flowering above the critical photoperiod ?
 (1) Wheat (2) Spinach
 (3) *Henbane* (4) *Xanthium*
13. Which is **incorrect** statement with respect to phytochrome ?
 (1) It exist in two interconvertible forms
 (2) P_r form, absorb far red light and convert into P_{fr} form
 (3) P_{fr} induce flowering in LDP
 (4) P_{fr} convert in P_r in dark
14. When a plant receive proper light / dark duration then a hormone migrate from leaves to shoot apices for inducing flowering. Find that hormone :-
 (1) vernalin (2) florigen
 (3) auxin (4) GA
15. (i) It affects flowering either quantitatively or qualitatively
 (ii) It reduces life-span of the plants
 (iii) It prevent precocious reproductive development late in growing season
 (iv) Perception site is dividing tissue
 (v) It can be observed in both annual and biennial plants.
 Which of the above statements are **correct** with respect to vernalisation ?
 (1) i, ii, iii, iv, v (2) iii & v only
 (3) i, iii & v only (4) iii, iv & v only

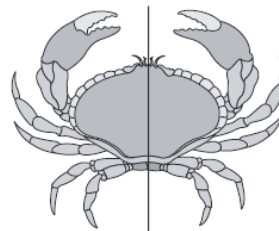
ANIMAL KINGDOM # 01 : INTRODUCTION & BASIS OF CLASSIFICATION

- Which one of the following feature is not used as a basis of animal classification ?
(1) Arrangement of cells.
(2) Pattern of coelome.
(3) Pattern of symmetry.
(4) Pattern of endocrine system.
- Which of the following statement is incorrect?
(1) In chordates, heart is ventrally located.
(2) In non-chordates, nerve cord is ventrally located.
(3) In all echinoderms, anus is ventrally located.
(4) In molluscs, muscular foot is ventrally located.
- This diagrammatic sectional view is the representation of :-



- (1) Eucoelomate animal.
(2) Pseudocoelomate animal.
(3) Acoelomate animal.
(4) Enterocoelomate animals.
- Metamerism means :-
(1) Body is externally and internally divided into segments.
(2) Each segments of body have serial wise repetition of at least some organs.
(3) Both (1) and (2).
(4) There is no repetition of any organ in successive segments.
- Select the correct phylum which includes bilaterally symmetrical, eucoelomate, protostomiate animals having close circulatory system ?
(1) Aschelminthes.
(2) Annelida.
(3) Platyhelminthes.
(4) Arthropoda.
- Choose the unisexual endoparasite ?
(1) *Taenia*.
(2) *Fasciola*.
(3) *Schistosoma*.
(4) *Mosquito*.

- This type of symmetry is found in :-



- (1) *Fasciola*, *Hydra*, *Aurelia*.
(2) Cockroach, *Octopus*, Starfish.
(3) Dog fish, *Octopus*, *Ascaris*.
(4) Cockroach, *Pleurobrachia*, Frog.
- Tissue level of body organisation is found in:-
(1) Porifera. (2) Platyhelminthes.
(3) Ctenophora. (4) Protozoa.
- Match column-I and column-II and select the correct option ?

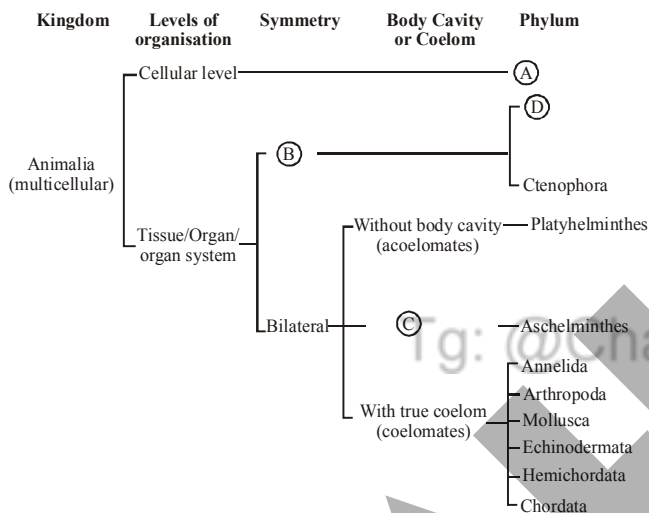
Column-I		Column-II	
I	Diploblastic	a	True segmentation.
II	Metamerism	b	Two embryonic germ layer.
III	Notochord	c	Ventrally present, mesodermal rod like structure.
		d	Dorsally present, mesodermal rod like structure.

- | | | |
|-------|----|-------|
| I | II | III |
| (1) b | a | c |
| (2) b | a | d |
| (3) b | a | c & d |
| (4) b | c | d |
- Read the following statements carefully :-
"Digestive system has only a single opening to the outside of the body that serves as both mouth and anus and is hence called A and it is found in B."
In above statement, what is A and B ?
(1) A - Incomplete digestive system
B - Platyhelminthes
(2) A - Incomplete digestive system
B - Aschelminthes
(3) A - Complete digestive system
B - Annelida
(4) A - Complete digestive system
B - Platyhelminthes

11. Which one of the following statements is incorrect?

- (1) When any plane passing through the central axis of the body divides the organism into two identical halves, it is called bilateral symmetry.
- (2) When blood is circulated through a series of vessels of varying diameter in whole body, such circulation is known as closed type of circulatory system.
- (3) Notochord is absent in nonchordate animals.
- (4) Body cavity of animal, which is lined by mesoderm is called coelom.

12. Complete the following chart by choosing correct option for A, B, C and D :-



Options :-

	A	B	C	D
(1)	Protozoa	Bilateral	Coelomates	Cnidaria
(2)	Porifera	Radial	Pseudocoelomates	Cnidaria
(3)	Protozoa	Bilateral	Acoelomates	Aschelminthes
(4)	Porifera	Radial	Acoelomates	Ctenophora

13. *Pleurobrachia*, *Aurelia*, *Scorpion*, *Ascaris*, *Asterias*, *Ophiura*, *Physalia*, *Taenia*.

Out of these from the above list, how many animals represent radial symmetry ?

- (1) Four
- (2) Five
- (3) Two
- (4) Six

14. Exclusively marine animals are found in which phyla ?

- (1) Porifera and coelenterata
- (2) Coelenterata and ctenophora
- (3) Echinodermata and porifera
- (4) Echinodermata and ctenophora

15. Deuterostome animals are included in :-

- (1) Annelida, Arthropoda & Mollusca
- (2) Mollusca, Echinodermata & Hemichordata
- (3) Echinodermata, Hemichordata & chordata
- (4) Platyhelminthes, Nematoda & chordata

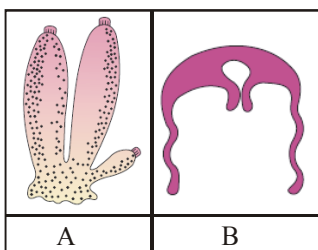
ANIMAL KINGDOM # 02 : PROTOZOA, PORIFERA,
COELENTERATA & CTENOPHORA

1. Match column I and Column II and select the correct option ?

	Column-I		Column-II
A	<i>Hydra</i>	i	Choanocytes
B	<i>Scypha</i>	ii	Trichocyst
C	<i>Meandrina</i>	iii	Polyp stage
D	<i>Paramaecium</i>	iv	Coral
		v	Statocyst

Options :-

- (1) A-iii, B-i, C-iv, D-v (2) A-v, B-i, C-iii, D-v
(3) A-iii, B-i, C-iv, D-ii (4) A-v, B-iv, C-iii, D-ii
2. Which one of the following feature is not exhibited by "*Pleurobrachia*" ?
- (1) They are found in marine water and are pelagic animal.
(2) The body bears eight internal rows of ciliated comb-plates.
(3) Digestion is of both extracellular and intracellular -type.
(4) Reproduction takes place only by sexual means.
3. Select the mismatched pair ?
- (1) Pathogenic protozoans → *Trypanosoma* and *Leishmania*.
(2) Monogenetic parasite → *Entamoeba* and *Giardia*.
(3) Cnidarians → *Physalia* and *Pleurobrachia*.
(4) Digenetic parasite - *Plasmodium* and *Trypanosoma*.
4. Diagrams of two animal phyla are given below. Identify the common character in them ?



- (1) Both exhibit the intracellular and extra cellular digestion.
(2) Both having the water canal system.
(3) Both are dimorphic animals.
(4) Both are reproduced by sexual and asexual methods and development is indirect.

5. Which is not a function of cnidoblast in coelenterates ?

- (1) Anchorage.
(2) Locomotion and defence.
(3) Capturing of prey.
(4) Storage of food.

6. Select the unique feature of sponges ?

- (1) Porous body and having vascular system.
(2) Porous body and having water canal system.
(3) Intracellular digestion.
(4) Presence of endoskeleton.

7. How many mis-matched sets are there in the table given below with respect to common name, scientific name and phylum for different animals?

	Common Name	Scientific Name	Phylum
A	Boring sponge	<i>Sycon</i>	Porifera
B	Fresh water sponge	<i>Spongilla</i>	Porifera
C	Sea-fan	<i>Gorgonia</i>	Coelenterata
D	Bath sponge	<i>Euspongia</i>	Porifera
E	Silver fish	<i>Aurelia</i>	Coelenterata
F	Sea walnut	<i>Ctenoplana</i>	Ctenophora

Option :-

- (1) One
(2) Two
(3) Four
(4) All are matched
8. Select the incorrect statement with regard to coelenterates ?
- (1) Polyp reproduces asexually to form medusa.
(2) Medusa reproduces sexually to form polyp.
(3) Polyp is sessile and umbrella shaped.
(4) Medusa is a free-swimming stage.

9. Fill in the blanks and choose the correct option?
 "In sponges, fertilization is A and development is B, having a larval stage which is morphologically C from the adult.
 (1) A-Internal, B-Indirect, C-Distinct
 (2) A-Internal, B-Indirect, C-Similar
 (3) A-External, B-Direct, C-Distinct
 (4) A-External, B-Indirect, C-Similar
10. Metagenesis is seen in :-
 (1) *Aurelia* (2) *Obelia*
 (3) *Adamsia* (4) Both (1) and (2)
11. Correct flow of water-current in sponges is :-
 (1) Ostia – osculum – spongocoel – outside
 (2) Osculum – spongocoel – ostia – outside
 (3) Ostia – gastrovascular cavity – osculum – outside
 (4) Ostia – paragastric cavity – osculum – outside
12. Which type of cells of "sponges" perform similar function to interstitial cells of "*Hydra*"?
 (1) Thesocytes (2) Myocytes
 (3) Scleroblast (4) Archaeocytes

Tg: @Chalnaayaaar

ANIMAL KINGDOM # 03 : PLATYHELMINTHES, ASCHELMINTHES & ANNELIDA

- Select the wrong statement :-
 (1) Setae and parapodia are absent in leeches.
 (2) Mostly leeches are found in water bodies and are sanguivorous.
 (3) Body segments are fixed in leeches.
 (4) Trochophore larva is formed during the development of leeches.
- Match column I, II and III and choose the correct combination from the given options ?

	Column I		Column II		Column III
a	<i>Wuchereria</i>	i	Liver fluke	Q	Cysticercosis
b	<i>Hirudinaria</i>	ii	Filarial worm	R	Metamerism
c	<i>Taenia</i>	iii	Blood sucking leech	S	Liver rot
d	<i>Fasciola</i>	iv	Tapeworm	T	Elephantiasis

Options :-

	a	b	c	d
1	ii,R	iii,T	i,S	iv,Q
2	ii,T	iii,R	iv,Q	i,S
3	ii,R	iii,Q	iv,T	i,S
4	ii,Q	iii,R	iv,S	i,T

- Excretory organ of "*Planaria*" is :-
 (1) Flame cells (2) Nephridia
 (3) Renette cell (4) Metanephridia
- Read the following features :-
 (a) Complete alimentary canal with well developed muscular pharynx.
 (b) Dioecious animal.
 (c) Well marked cephalization.
 (d) Pseudocoelomate animal.
 (e) External fertilization.
 Features select the which are not suitable for Nematodes ?
 (1) c and e (2) b and c
 (3) a and b (4) d and e

- Select the correct option in which all the larval stages of "*Fasciola*" are arranged sequentially and correctly according to the formation in life cycle?
 (1) Miracidium – Sporocyst – Redia – Metacercaria – Cercaria
 (2) Miracidium – Redia – Sporocyst – Cercaria – Metacercaria
 (3) Metacercaria – Sporocyst – Redia – Miracidium – Cercaria
 (4) Miracidium – Sporocyst – Redia – Cercaria – Metacercaria
- Read the following statements carefully :-
 (a) Hooks and suckers are present in parasitic forms.
 (b) Some members absorb nutrients from the host directly through their body surface.
 (c) Fertilization is internal and development is through many larval stages.
 Above statements are correct for :-
 (1) Platyhelminthes (2) Aschelminthes
 (3) Annelida (4) Mollusca
- The body of these animals are dorsoventrally flattened. They are mostly endoparasite and first triploblastic animals. They are bilaterally symmetrical and acoelomate animals. These animals belong to which phylum of the animal kingdom ?
 (1) Annelida.
 (2) Nematoda.
 (3) Platyhelminthes.
 (4) Ctenophora.
- Select the odd set of animals ?
 (1) *Planaria*, *Fasciola*, *Taenia*
 (2) *Ascaris*, *Ancylostoma*, *Enterobius*
 (3) *Neries*, *Pheretima*, *Hirudinaria*
 (4) *Euspongia*, *Spongilla*, *Nereis*
- Syncytial epidermis is characteristic feature of:-
 (1) Earthworm
 (2) *Taenia*
 (3) *Fasciola*
 (4) *Wuchereria*

10. Which is the larval form of "*Taenia solium*" that is infectious for human ?
 (1) Bladder worm (2) Onchosphere
 (3) Hexacanth (4) Cysticercus
11. What is common in flat worm and round worm?
 (1) Both are included in phylum platyhelminthes
 (2) Both have flame cells as excretory organ
 (3) Circulatory system is absent in both
 (4) Both are sexually dimorphic animals
12. Match the columns and choose the correct answer from the options given below ?

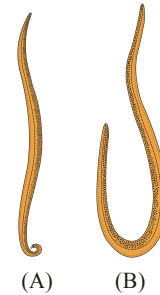
	Phylum		Common name		Scientific name
a	Annelida	i	Pork tapeworm	A	<i>Enterobius</i>
b	Aschelminthes	ii	Pin worm	B	<i>Neries</i>
c	Platyhelminthes	iii	Sand worm	C	<i>Taenia</i>

Option :-

	a	b	c
1	iii, B	i, C	ii, A
2	ii, B	iii, A	i, C
3	iii, B	ii, A	i, C
4	ii, B	iii, C	i, A

13. From the following relationships between animal and their character, mark the correct option ?
 (1) *Neries* – Fresh water animal and belongs to phylum annelida
 (2) Leech – 33 segmented body having haemocoelomic system.
 (3) *Taenia* – Tapeworm having complete alimentary canal
 (4) *Ascaris* – Round worm which is acoelomate

14. Identify the given diagram of the animal and select the correct option which includes the correct features of that animal ?



Option :-

- (1) A is ♀ *Ascaris* and B is ♂ *Ascaris*. Male *Ascaris* is smaller than female *Ascaris*.
 (2) A is ♂ *Ascaris* and B is ♀ *Ascaris*. Posterior terminal of male is curved while in ♀ *Ascaris* it is straight.
 (3) A is ♂ *Ascaris* and B is ♀ *Ascaris*. Male *Ascaris* is more longer than female *Ascaris*.
 (4) A is ♀ *Ascaris* and B is ♂ *Ascaris*. ♀ *Ascaris* has curved posterior end while in ♂ *Ascaris* it is straight.
15. Detachment of gravid proglottids from body of *Taenia* is known as :-
 (1) Regeneration
 (2) Eutely
 (3) Apolysis
 (4) Apogonesis

ANIMAL KINGDOM # 04 : ARTHROPODA, MOLLUSCA, ECHINODERMATA, HEMICHORDATA

- Which one is the representative of phylum arthropoda?
(1) Cuttle fish
(2) Fighting fish
(3) Silver fish
(4) Cat fish
- Match column I, II and III and choose the correct combination from the given options ?

	Column I		Column II		Column III
A		i	Scorpion	p	Gregarious pest
B		ii	Locust	q	Green gland
C		iii	Prawn	r	Viviparous animal
D		iv	Butterfly	s	Holometabolous type of development

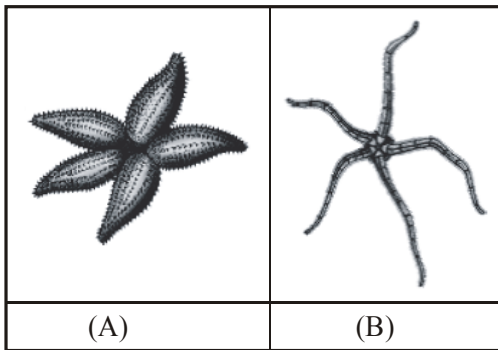
Option :-

	A	B	C	D
1	iii, q	iv, r	i, s	ii, p
2	ii, q	iii, r	iv, s	i, p
3	iii, q	iv, s	i, r	ii, p
4	i, p	ii, q	iii, r	iv, s

- Fill in the blanks at sites A and B in the given below sentence :-
"The adult echinoderms show A but larvae show B"
Option :-
(1) A = Radial symmetry, B = Bilateral symmetry
(2) A = Bilateral symmetry, B = Radial symmetry
(3) A and B = Both radial symmetry
(4) A = Asymmetry, B = Bilateral symmetry

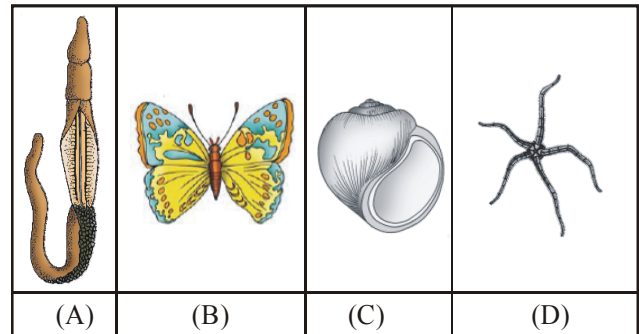
- Members of which phylum have true coelom and unsegmented body ?
(1) Annelida (2) Mollusca
(3) Arthropoda (4) Chordata
- The most distinctive feature of echinoderms is the:-
(1) Presence of endoskeleton of calcareous ossicles.
(2) Absence of excretory system.
(3) Presence of water vascular system.
(4) Five arms
- Find out the incorrect match for body division?
(1) Arthropoda - Head, thorax and abdomen.
(2) Mollusca - Head, muscular foot and visceral hump.
(3) Hemichordata - Proboscis, collar and trunk.
(4) Amphibia - Head, neck and trunk.
- Read the following statements :-
(a) This phylum consists of a small group of worm like marine animals.
(b) They are bilaterally symmetrical, triploblastic and coelomate animals.
(c) Heart is found on dorsal surface.
(d) Respiration takes place through gills.
These features are suitable for :-
(1) Aschelminthes (2) Mollusca
(3) Echinodermata (4) Hemichordata
- A student collected various animals whose common names are as follows :-
(Devil fish, Cuttle fish, Dog fish, Star fish, Rat fish, Jelly fish, Flying fish and silver fish)
Find out the number of animals those are not true fishes ?
(1) Four (2) Three
(3) Five (4) Two
- "*Osphradium*" is a sensory structure which is found in *molluscs*. It acts as :-
(1) Balancing organ (2) Thermoreceptor
(3) Chemoreceptor (4) Rheoreceptor

10. Identify the correct characteristic features shown by the given figures ?



- (1) Triploblastic and Protostomes
(2) Mouth found on dorsal while anus found on ventral surface
(3) Excretory system is well developed
(4) Sexes are separate and external fertilization
11. Which of the following group of animals belongs to the same phylum ?
(1) *Balanoglossus*, *Saccoglossus*, *Amphioxus*
(2) *Asterias*, *Antedon*, *Ophiura*
(3) *Prawn*, *Pila*, *Pinctada*
(4) *Asterias*, *Antedon*, *Dentalium*
12. "Proboscis gland" is excretory organ of phylum:-
(1) Arthropoda
(2) Mollusca
(3) Annelida
(4) Hemichordata

13. Given below are sketches (A, B, C and D) of four different animals. Select the correct option which include their correct identification along with their taxonomic group and two features of that animal?



Option :-

	Identification	Taxonomic group	Features
(1)	C - <i>Pila</i>	Mollusca	(a) Segmented body (b) Viviparous animal
(2)	A - Leech	Annelida	(a) Metameric segmentation (b) Excretory organ nephridia
(3)	D - <i>Ophiura</i>	Echinodermata	(a) Marine animal (b) Water canal system present
(4)	B - Butterfly	Arthropoda	(a) Chitinous exoskeleton present (b) Oviparous animal

14. Which one is not an economically important insects?
(1) *Apis* (2) *Aedes*
(3) *Laccifer* (4) *Bombyx*

ANIMAL KINGDOM # 05 (PROTOCHORDATA TO PISCES)

1. I am a fish like creature and possess neither parapods nor muscular foot. I have neither eyes nor jaws, nor ventral nerve cord. But I have a lot of gill-slits and a notocord. I am a burrowing animal of marine water. I show ciliary mode of feeding. I have flame cells for excretion.

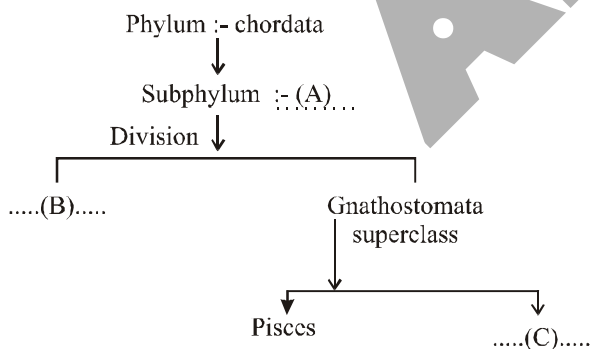
On the basis of above features, guess who I am ?

- (1) *Herdmania* (2) *Amphioxus*
(3) *Balanoglossus* (4) *Petromyzon*

2. Read the following statements and find out the incorrect statement ?

- (1) In urochordata, notochord is present only in larval tail.
(2) In cephalochordata, notochord is found in head region only and is persistent throughout their life.
(3) In vertebrata, notochord is replaced by vertebral column in adult.
(4) All vertebrates are chordates but all chordates are not vertebrates.

3. Given below is the chart of classification of chordata in which some group are left as blank and represented through alphabates A, B and C. Identify A, B and C and select the correct option?



Option :-

- (1) A = Protochordata, B = Agnatha
C = Tetrapoda
(2) A = Vertebrata, B = Agnatha,
C = Tetrapoda
(3) A = Vertebrata, B = Cephalochordata,
C = Tetrapoda
(4) A = Craniata, B = Vertebrata, C = Agnatha

4. Read the following statements and find out the incorrect statement ?

- (1) Dog fish have teeth that are modified placoid scales
(2) In fighting fish gills are covered by operculum while in sting ray, gill-covering is absent.
(3) Air-bladder is present in saw-fish which regulates buoyancy while in Angel fish air bladder is absent.
(4) Mouth of flying fish is terminal while it is ventral in great white shark.

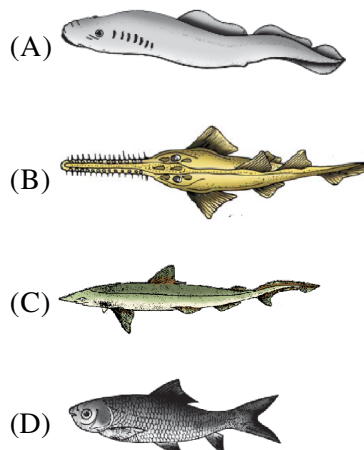
5. Read the following features :-

- (a) Heterocercal tail
(b) Ventral mouth
(c) Placoid scales on skin
(d) Presence of air bladder
(e) Homeothermal animals
(f) External fertilization.

How many features are not correct for "Dog fish"?

- (1) Two (2) Three
(3) Four (4) Only one

6. A, B, C and D represents different types of fishes.



Out of these, who are classified in same class?

Option :-

- (1) A & B (2) B and C
(3) C & D (4) A and D

7. "Poison sting" is found in :-
 (1) *Torpedo* (2) *Trygon*
 (3) *Pristis* (4) Both (2) & (3)
8. Identify the animal and its group and select the correct option ?



Options :-

- (1) *Ascidia* ; urochordata.
 (2) *Ascidia* ; cephalochordata.
 (3) *Balanoglossus* ; Hemichordata.
 (4) *Amphioxus* ; cephalochordata.
9. Match the column-I and column-II and select the correct option ?

	Column-I		Column-II
A	Fighting fish	i	<i>Pterophyllum</i>
B	Flying fish	ii	<i>Pristis</i>
C	Angel fish	iii	<i>Betta</i>
D	Saw fish	iv	<i>Exocoetus</i>

Option :-

- (1) A-i, B-ii, C-iv, D-iii
 (2) A-iv, B-iii, C-ii, D-i
 (3) A-iii, B-iv, C-i, D-ii
 (4) A-iii, B-ii, C-i, D-iv

10. "Lateral line receptor system" is
 Found in all fishes which acts as :-
 (1) Thermoreceptor
 (2) Chemoreceptor
 (3) Rheoreceptor
 (4) Gustatoreceptor
11. Select the incorrect feature of cyclostomes ?
 (1) All living members are ectoparasites on fishes
 (2) Body bears 6-15 pairs gill-slits
 (3) Cranium and vertebral column are bony structures in them.
 (4) Scales and paired fins are absent in them.
12. Which is the jawless fish ?
 (1) Hag fish (2) Rohu
 (3) Lung fish (4) Cat fish
13. Catadromous migration is shown by :-
 (1) *Anguila*
 (2) *Hilsa*
 (3) *Petromyzon*
 (4) *Sturgeon*
14. Which of the following is characteristic feature of fishes ?
 (1) Tail and venous heart
 (2) Venous heart and gills
 (3) Epidermal scales and tail
 (4) Epidermal scales and gills
15. "Myxine" is not a true fish because of :-
 (1) Presence of gills
 (2) Absence of operculum on gill-aperture
 (3) Absence of paired fins and scales
 (4) Notochord is persistent throughout life.

ANIMAL KINGDOM # 06 (TETRAPODA)

1. Recognise the figure :-



Select the correct statement about this animal?

Options :-

- (1) *Salamandra* :- It is an amphibian and its larva is known as tadpole larva
- (2) Wall-Lizard :- It is a reptile and its body is divided into 4 parts : head, neck, trunk and tail
- (3) *Salamandra* :- It is an amphibian and its body is divided into head, trunk and tail
- (4) Garden Lizard :- It is a reptile and eyelids are immovable

2. Which one is the group of vertebrata in which skull is monocondylic and members are homeothermal and uricotelic ?

- (1) Reptilia
- (2) Pisces
- (3) Aves
- (4) Mammalia

3. Which is the most unique mammalian characteristic feature ?

- (1) Presence of hair on skin
- (2) Presence of testes in scrotum
- (3) Presence of ear pinna
- (4) Presence of milk producing gland

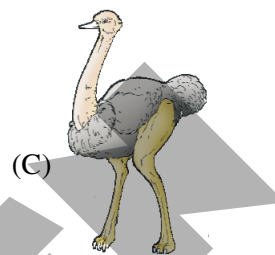
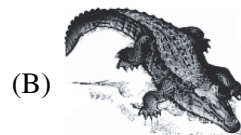
4. Read the following features :-

- (a) Homeothermal animals.
- (b) Skin : Non glandular and covered by scales or scutes.
- (c) Tympanum represents ear.
- (d) Heart : usually four chambered.
- (e) Cloaca present.
- (f) Fertilization is internal.

How many features are not shown by reptiles?

- (1) Two
- (2) Three
- (3) Four
- (4) One

5. Given below are the four figures



Choose an option with their correct identification and suitable class along with correct feature ?

Options :-

- (1) B = *Alligator*
:- Class-Reptilia
:- Three chambered heart.
- (2) C = *Struthio* :- Class-Aves
:- Flying bird having keeled sternum
- (3) A = *Ornithorhynchus*
:- Class : Mammalia.
:- Connecting link between reptilia and mammalia, having mammary gland
- (4) D = *Bufo*
:- Class : Amphibia
:- Parotid glands are modified into poisonous gland.

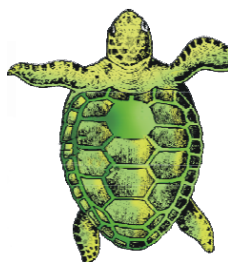
6. Match the column-I, II and III and select the correct option ?

	Column-I	Column-II	Column-III
(A)		(i) <i>Macropus</i>	(p) Feathered and non-glandular skin
(B)		(ii) <i>Catla</i>	(q) Hairy, glandular skin
(C)		(iii) <i>Chameleon</i>	(r) Dermal scales on skin
(D)		(iv) <i>Psittacula</i>	(s) Epidermal scales on skin

Options :-

	A	B	C	D
(1)	iv, p	iii, q	ii, r	i, s
(2)	iii, r	iv, p	i, q	ii, s
(3)	iii, s	iv, p	i, q	ii, r
(4)	iii, q	ii, p	i, r	iv, s

7. Select the incorrect statement for "flying fox"?
- (1) Mammary glands are present
 - (2) External ear with pinna present
 - (3) It is oviparous like bird
 - (4) It is a flying mammal
8. Which one feature is not related with the given below figure ?



- (1) Mouth is beak like
- (2) Cloacal respiration
- (3) Soft & moist skin
- (4) It has 3 chambered heart

9. Read the following features :-
- (a) Limb less reptile.
 - (b) Body is covered with epidermal scales.
 - (c) Poisonous
 - (d) 10 pairs cranial nerves present.
 - (e) Auditory opening and tympanum present.
 - (f) Oviparous
 - (g) Poikilothermal animal.
- How many features are not related with given below figure ?

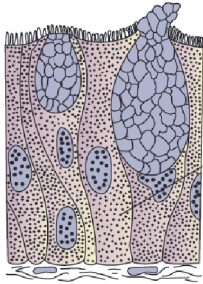


Option :-

- (1) Two (2) Three (3) Four (4) One
10. Select the mismatched set of animals ?
- (1) Non-poisonous snakes :- *Python*, Rat snake, *Eryx*
 - (2) Lizards :- *Calotes*, *Chameleon*, *Hemidactylus*
 - (3) Aquatic mammals :- *Balaenoptera*, *Delphinus*
 - (4) Flightless birds :- *Struthio*, *Rhea*, *Pavo*
11. Which is the incorrect statement for birds ?
- (1) Digestive tract of birds has additional chambers: crop and gizzard.
 - (2) In birds, all bones are hollow with air cavities.
 - (3) Hind limbs of birds have scales and are modified for walking, swimming and clapping.
 - (4) Air sacs are connected to the lungs of the birds for supplement of respiration.
12. Which pair of animals show the direct development in life cycle ?
- (1) Frog and *salamandra*.
 - (2) *Herdmania* and *Petromyzon*.
 - (3) Tortoise and snakes.
 - (4) *Pila* and Prawn.
13. Limb-less-amphibian is :-
- (1) *Rana*.
 - (2) *Ichthyophis*.
 - (3) *Ophiosaurus*.
 - (4) *Salamandra*.
14. Which one feature of mammals is found without any exception ?
- (1) Presence of hair on skin.
 - (2) All mammals are viviparous.
 - (3) Seven cervical vertebrae are found in vertebral column.
 - (4) Presence of diaphragm.

STRUCTURAL ORGANISATION OF ANIMALS (ANIMAL TISSUE) # 01
(Epithelial Tissue)

1.



Identify the correct option for the given diagram :-

- (1) Multicellular gland
- (2) An example is salivary gland
- (3) An example is goblet cell
- (4) An example is sweat gland

2. The tissue related with diffusion and filtration is :-

- (1) Simple columnar
- (2) Simple squamous
- (3) Compound squamous
- (4) Compound columnar

3. Brush bordered cuboidal epithelium is present in:-

- (1) Intestine
- (2) PCT of nephron
- (3) Stomach
- (4) Gall bladder

4. Match the following columns :-

(i)	Vasa-deferens	(a)	Pseudostratified ciliated glandular epithelium
(ii)	Trachea	(b)	Transitional epithelium
(iii)	Renal pelvis	(c)	Stratified cuboidal epithelium
(iv)	Salivary gland	(d)	Steriociliated columnar epithelium

- (1) i (d), ii (a), iii (b), iv (c)
- (2) i (a), ii (b), iii (c), iv (d)
- (3) i (d), ii (b), iii (a), iv (c)
- (4) i (a), ii (d), iii (c), iv (b)

5. Germinal layer is present in:-

- (1) Simple squamous epithelium
- (2) Stratified squamous epithelium
- (3) Simple cuboidal epithelium
- (4) Simple columnar epithelium

6. The tissue in which property of secretion and absorption is limited is :-

- (1) Stratified squamous
- (2) Stratified columnar
- (3) Stratified cuboidal
- (4) All of these

7. Match the following columns :-

(i)	Unicellular gland	(a)	Pancreas
(ii)	Serous glands	(b)	Sebaceous gland
(iii)	Heterocrine gland	(c)	Goblet cell
(iv)	Holocrine glands	(d)	Watery secretion

- (1) i (c), ii (a), iii (d), iv (b)
- (2) i (c), ii (d), iii (a), iv (b)
- (3) i (c), ii (d), iii (b), iv (a)
- (4) i (a), ii (d), iii (c), iv (b)

8. Select **incorrect** match with respect to simple epithelium shown and its location in the body?

	Simple epithelium	Location
(1)		Walls of blood vessels and air sacs of lungs
(2)		Ducts of glands and tubular parts of nephrons
(3)		PCT of nephron
(4)		Bronchioles and fallopian tubes

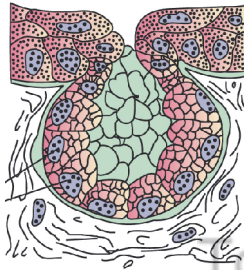
9. Which of the following are **correct** for epithelial tissue?

- (A) It has free surface which may face towards the body fluid.
- (B) It provides covering for some part of body
- (C) Intercellular matrix is abundant
- (D) It lies on basement membrane.

Options are

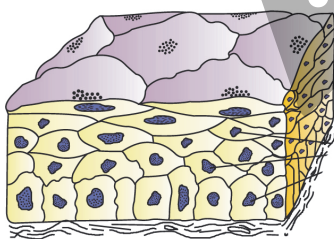
- (1) (A), (B), (C), (D)
- (2) Only (C)
- (3) (A), (C), (D)
- (4) (A), (B), (D)

10. Choose the **incorrect** option for the secretion of given tissue in the given figure :-



- (1) Saliva
- (2) Mucus
- (3) Tear
- (4) Milk

11. Choose the **correct** location of tissue for given diagram :-



- (1) PCT of nephron
- (2) Blood vessels
- (3) Air sacs of lungs
- (4) Covers the dry surface of skin

12. Simple epithelium will be present in how many of the following structures?

Alveoli, Skin, Nephrons, Tendon, Cartilage, Blood vessel, Alimentary canal

- (1) Three
- (2) Four
- (3) Two
- (4) Five

13. All the following structures are lined by transitional epithelium except :-

- (1) Urinary bladder
- (2) Renal pelvis
- (3) Ureter
- (4) Oesophagus

14. Select the **correct** statement about compound epithelium :-

- (A) It is made of more than one layer of cells.
- (B) It has limited role in secretion and absorption
- (C) Every cell of this epithelium is in contact with the basement membrane without any exception.
- (D) It is highly vascular tissue.

Options are :-

- (1) (C), (D)
- (2) (D) only
- (3) (A) and (B)
- (4) (A), (B) and (C)

15. Goblet cells are the examples of :-

- (1) Unicellular glands
- (2) Multicellular glands
- (3) Endocrine glands
- (4) Both (2) and (3)

16. Which modification of cell membrane increase maximum surface area for absorption?

- (1) Villi
- (2) Microvilli
- (3) Cilia
- (4) Stereocilia

17. Our body is composed of four types of tissues. How many tissues from the following originated only from mesodermal germ layer? (Epithelial, Connective, Muscular, Nervous)

- (1) 3
- (2) 2
- (3) 1
- (4) 4

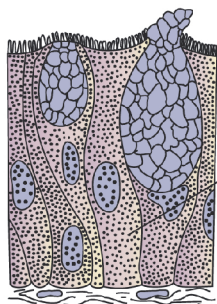
18. Brush bordered columnar epithelium is found in :-

- (1) Gall bladder
- (2) Skin
- (3) Epididymis
- (4) Stomach

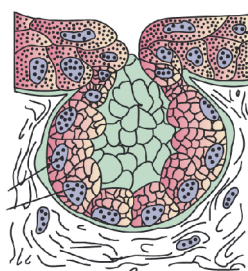
19. Tissue which faces either a body fluid or the outside environment is :-

- (1) Muscular tissue
- (2) Nervous tissue
- (3) Connective tissue
- (4) Epithelial tissue

20. Transitional epithelium includes a specific type of junction called as :-
 (1) Tight junction.
 (2) Gap junction.
 (3) Interdigitations.
 (4) Adhering junction.
21. Given below structures are related with glandular epithelium. Identify them and choose the correct option.



(a)



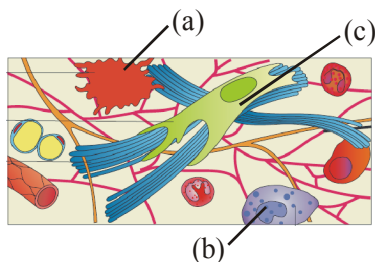
(b)

	(a)	(b)
(1)	Unicellular	Multicellular
(2)	Unicellular	Unicellular
(3)	Multicellular	Unicellular
(4)	Multicellular	Multicellular

22. Which junction helps to stop substances from leaking across a tissue ?
 (1) Tight junction
 (2) Adhering junction
 (3) Gap junction
 (4) Desmosome

STRUCTURAL ORGANISATION OF ANIMALS (ANIMAL TISSUE) # 02
(Connective Tissue)

1.



In the given figure, identify marked (a), (b) (c):-

- (1) Fibroblast, macrophage, lymphocyte
(2) Macrophage, mast cell, fibroblast
(3) Plasma cell, mast cell, fibroblast
(4) Fibroblast, plasma cell, macrophage

2. The cells in which chromatin is arranged like spokes in nucleus is :-

- (1) Fibroblast cell
(2) Plasma cell
(3) Adipose cell
(4) Mesenchymal cell

3. Dense regular connective tissue is present in:-

- (1) Ligaments (2) Tendon
(3) Spleen (4) (1) and (2) both

4. Match the following columns :-

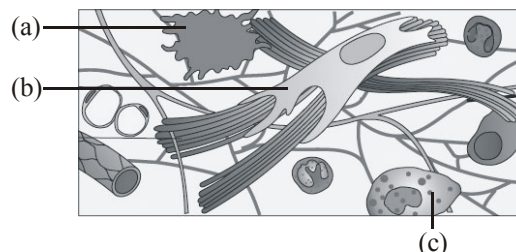
(i)	Compact bone	(a)	Ribs
(ii)	Sesamoid bone	(b)	Clavicle
(iii)	Cartilagenous bone	(c)	Haversian canal
(iv)	Membranous bone	(d)	Patella

- (1) i (c), ii (d), iii (b), iv (a)
(2) i (d), ii (c), iii (a), iv (b)
(3) i (c), ii (d), iii (a), iv (b)
(4) i (b), ii (a), iii (d), iv (c)

5. Which of the following is not a natural anticoagulant:-

- (1) Heparin (2) Anophelin
(3) Hirudin (4) EDTA

6. In the given diagram, what are the functions of (a), (b) and (c) ?



	a	b	c
1	Phagocytosis	Secrete fibres	Secrete heparin
2	Phagocytosis	Secrete heparin	Secrete fibres
3	Secrete heparin	Secrete fibres	Phagocytosis
4	Secrete fibres	Secrete heparin,	Phagocytosis

7. Tendons are :-

- (A) Dense regular connective tissue with elastic fibres.
(B) Dense regular connective tissue with collagen fibres.
(C) Dense irregular connective tissue with collagen fibres.
(D) Dense irregular connective tissue with elastic fibres.

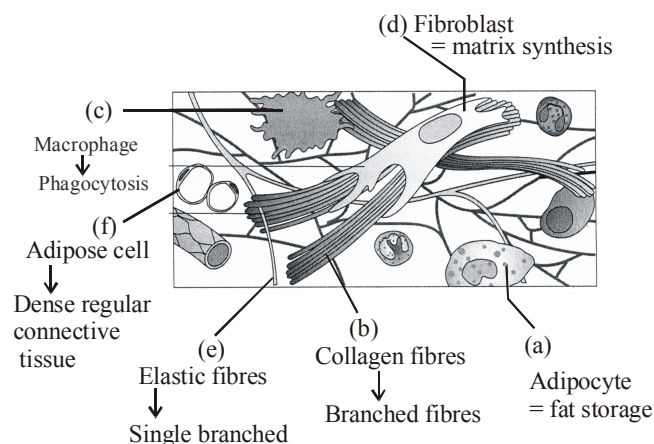
Options are

- (1) Only (B)
(2) (B) and (C)
(3) (A) and (D)
(4) (A) and (C)

8. Which is the principal cell of aerolar tissue and secrete maximum amount of matrix?

- (1) Mast cells
(2) Plasma cells
(3) Histiocytes
(4) Fibroblast

9. Given diagram is a cross section of body tissue. Different labels are located in this diagram. Which of the following is *incorrectly* matched with their function ?

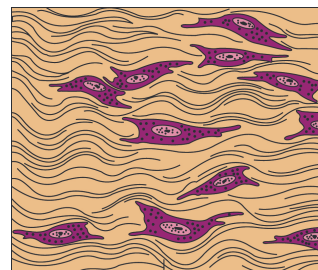


- (1) a, c, d (2) b, c, d
(3) a, b, f (4) b, e, f
10. Read the following statements (A–D)
- (A) Muscular tissue is most abundant and widely distributed tissue.
- (B) All connective tissue cells including blood secretes fibres of structural proteins called collagen or elastin.
- (C) Epithelial cells rest on basement membrane.
- (D) Blood often serves as support framework of epithelium.
- How many of the above statements are incorrect?
- (1) One (2) Three (3) Two (4) Four
11. Which one is an incorrect match ?

(1)	Compound epithelium	Main role in secretion and absorption
(2)	Areolar tissue	Support frame work for epithelium
(3)	Blood	Specialised C.T.
(4)	Dense regular connective	Tendon and ligaments

12. Loose connective tissue is found :-
- (1) Tendon and ligaments.
(2) Beneath skin.
(3) Blood.
(4) Cartilage and bone.

13. Find out the incorrect match :-
- (1) Widely distributed tissue – Connective tissue.
(2) Gap junction – Faciliate communication.
(3) Secretion of fibres – Blood cells.
(4) 40–50% part of body – Muscular tissue.
14. ____fibres are oriented differently with ____ cells in dense irregular connective tissue.
- (1) Elastic, Macrophages.
(2) Collagen, Mast cells.
(3) Reticular, Fibroblast.
(4) Collagen, Fibroblast.
15. Semifluid ground substance is most abundant in ?
- (1) Dense regular connective tissue.
(2) Areolar connective tissue.
(3) All specialised connective tissue.
(4) Simple columnar epithelium.
16. A tissue that is found in our body as connecting and supporting structures is :-
- (1) Epithelial tissue (2) Muscular tissue
(3) Nervous tissue (4) Connective tissue
17. Connective tissue represents different functions except :-
- (1) Linking body structures.
(2) Support to body.
(3) Highest regeneration power.
(4) O₂ and CO₂ transportation.
18. Observe the following diagram and find out correct option related to this :-



- (1) Skin.
(2) Tendon and Ligaments.
(3) Pericardium.
(4) Glisson's capsule.

19. Tendon is :-

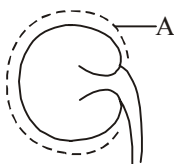
- (1) Modified white fibrous tissue which connects bone to bone.
- (2) Modified yellow fibrous tissue which connects bone to bone.
- (3) Modified white fibrous tissue which connects bone to muscle.
- (4) Modified yellow fibrous tissue which connects bone to muscle.

20. Identify the correct match from the column I, II and III

Column I	Column II	Column III
1 Fibroblast	a Oval shaped	i Serotonin, Histamine secretion
2 Macrophage	b Kidney shaped nucleus	ii Secretion of protein fiber
3 Mast cell	c S-shaped nucleus	iii Fat storage
4 Adipocyte	d Irregular shape	iv Phagocytosis

- (1) 1-d-ii, 2-c-iv, 3-b-i, 4-a-iii
- (2) 1-d-ii, 2-b-iv, 3-c-iii, 4-a-i
- (3) 1-d-ii, 2-b-iv, 3-c-i, 4-a-iii
- (4) 1-d-ii, 2-b-iv, 3-a-i, 4-c-iii

21. 'A' is made up of



- (1) Dense regular C.T.with bundles of collagen fibres.
- (2) Dense regular C.T.with bundles of elastic fibres
- (3) Dense irregular C.T.with bundles of reticular fibres.
- (4) Dense irregular C.T.with bundles of collagen fibres.

22. Tela Subcutanea, Periosteum, Tendon, Ligament respectively are :-

- (1) Areolar C.T, Sheath of WFCT, sheath of WFCT, Areolar C.T.
- (2) Sheath of WFCT, Areolar C.T., Areolar C.T., Areolar C.T.
- (3) Areolar C.T., Sheath of WFCT, Dense C.T., Dense C.T.
- (4) Areolar C.T., Cord of WFCT, Areolar C.T., Areolar C.T.

23. Which of the given below structure belongs to areolar connective tissue ?

- (1) Ligament
- (2) Tendon
- (3) Tela subcutanea
- (4) Panniculus adiposus

24. Articular cartilage is an example of :-

- (1) Hyaline cartilage
- (2) Elastic cartilage
- (3) White fibrous cartilage
- (4) Calcified cartilage

25. Trabeculae filled with bone marrow is present in:-

- (1) Epiphysis
- (2) Diaphysis
- (3) Metaphysis
- (4) Compact part of bone

26. The strongest cartilage is :-

- (1) Hyaline cartilage
- (2) Elastic cartilage
- (3) White fibrous cartilage
- (4) Calcified cartilage

27. Process of osteocyte are present in minute canals of lacuna, these canals are called as :-

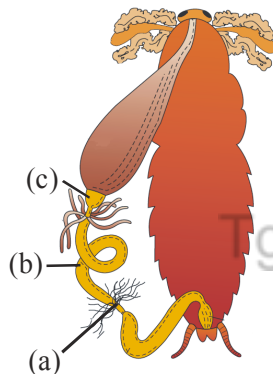
- (1) Lamella
- (2) Dendrites
- (3) Canaliculi
- (4) Haversian canal

28. Which bone developed from the ossification of tendon ?

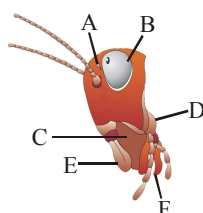
- (1) Sesamoid bone
- (2) Visceral bone
- (3) Dermal bone
- (4) Cartilagenous bone

STRUCTURAL ORGANISATION OF ANIMAL (COCKROACH)

- Which is not true with respect to the vision of cockroach ?
 (1) Mosaic vision.
 (2) Superposition vision.
 (3) More sensitivity.
 (4) Less resolution.
- Which of the following is mis-matched with respect to cockroach?
 (1) Ocelli : Simple eyes in cockroach.
 (2) Hypopharynx : A mouth part act as a tongue.
 (3) Antennae - Touch receptors only.
 (4) Elytra - Mesothoracic wings.
- Identify correctly matched (a), (b), (c)

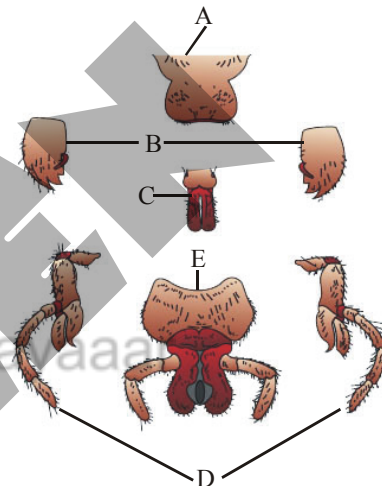


- (1) Colon, Mesenteron, Crop
 (2) Ileum, Mesenteron, Gizzard
 (3) Ileum, Mesenteron, Crop
 (4) Colon, Mesenteron, Gizzard
- Which is incorrect for circulatory system of cockroach?
 (1) Blood vessels are poorly developed.
 (2) Plasma, haemocytes, erythrocytes are present.
 (3) Heart chamber possess ostia on either side.
 (4) Paired alary muscles are present.
- The following figure is related to head region of cockroach. Identify A to F



- (1) A = Compound eye B = Ocellus
 C = Maxillae D = Mandible
 E = Labrum F = Labium
 (2) A = Ocellus B = Compound eye
 C = Mandible D = Maxillae
 E = Labrum F = Labium
 (3) A = Ocellus B = Compound eye
 C = Mandible D = Maxillae
 E = Labium F = Labium
 (4) A = Ocellus B = Compound eye
 C = Maxilla D = Mandible
 E = Labium F = Labium

6.

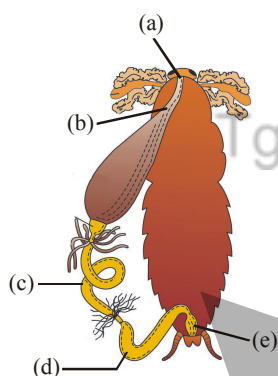


The above figure is related with mouth part of cockroach. Identify A to E

- (1) A = Maxillae B = Hypopharynx
 C = Labium D = Mandible
 E = Labrum
 (2) A = Mandible B = Labium
 C = Maxilla D = Labrum
 E = Hypopharynx
 (3) A = Labrum B = Mandible
 C = Hypopharynx D = Maxilla
 E = Labium
 (4) A = Labium B = Hypopharynx
 C = Labrum D = Maxilla
 E = Mandible
- Chitin absent in which type of mouth parts of Cockroach ?
 (1) Labrum.
 (2) Mandibles.
 (3) Hypopharynx.
 (4) Labium.

8. In male and female cockroach 10th segments bears of a pair of jointed filamentous structure called :-
 (1) Antennae
 (2) Anal style
 (3) Anal cerci
 (4) Ootheca pore
9. In cockroach, each leg is :-
 (1) 4 segmented (2) 3 segmented
 (3) 5 segmented (4) 6 segmented
10. In cockroach, IInd maxillae present in which side of pre-oral cavity?
 (1) Dorsal (2) Lateral
 (3) Ventral (4) Mid-dorsal
11. Which type of receptors are present in antennae of cockroach?
 (1) Gustatory receptors only.
 (2) Chemoreceptors only.
 (3) Tactile receptors only.
 (4) Tactile and olfactory receptors.
12. Which type of structure in cockroach monitoring the environment ?
 (1) Anal style (2) Ootheca
 (3) Antennae (4) Anal cerci
13. In cockroach how many segments present in anal cercus :-
 (1) 14 (2) 16 (3) 15 (4) 50
14. In cockroach, every segment of leg, highly sensitive receptor present called :-
 (1) Tangoreceptor
 (2) Thermoreceptor
 (3) Proprioceptor
 (4) Olfactory receptor
15. The head of cockroach lacks :-
 (1) Occiput (2) Gena
 (3) Trochanter (4) Frons
16. Which type of mouth parts present in lateral side of pre-oral cavity in cockroach ?
 (1) Labrum and Mandibles
 (2) Mandibles and Labium
 (3) Mandibles and Ist maxillae
 (4) Mandibles and Hypopharynx
17. The head of the cockroach is formed by the fusion of how many segments ?
 (1) Five (2) Six
 (3) Nine (4) Ten
18. Cockroach is nocturnal animal this habit is show ?
 (1) Biological clock effect
 (2) Light effect
 (3) Both
 (4) Non functional compound eyes
19. Which part has teeth like structure in cockroach?
 (1) Tongue (2) Maxilla
 (3) Mandible (4) Labrum
20. In cockroach upper lips is :-
 (1) Labium (2) Mandible
 (3) Maxilla (4) Labrum
21. Which type of structure in cockroach pick-up the food and put it in pre-oral cavity ?
 (1) IInd maxillae
 (2) Maxillary palp
 (3) Antennae
 (4) Labial palp
22. Which structure is unpaired in mouth part of cockroach ?
 (1) Mandible
 (2) Labrum
 (3) 1st maxilla
 (4) Both 2 and 3
23. In cockroach a sac like structure present in alimentary canal and used for storing of food called :-
 (1) Pharynx (2) Gizzard
 (3) Crop (4) Stomach
24. In nerve cord of cockroach, how many segmental ganglia present in the thorax and abdomen respectively :-
 (1) 3, 7 (2) 3, 5
 (3) 3, 9 (4) 3, 6
25. Mushroom gland is a part of :-
 (1) Male reproductive system of earthworm.
 (2) Female reproductive system of earthworm.
 (3) Male reproductive system of cockroach.
 (4) Female reproductive system of cockroach.
26. Which structure represent the brain of cockroach?
 (1) Supra-Pharyngeal ganglion
 (2) Sub-Pharyngeal ganglion
 (3) Supra-Oesophageal ganglion
 (4) Sub-Oesophageal ganglion

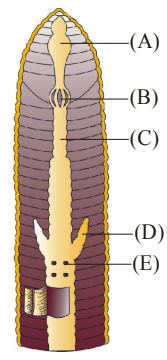
27. Find out correct statements about cockroach :-
 (A) Anal cerci present both male and female
 (B) Excretory organs are nephridia
 (C) Nocturnal and omnivorous animal
 (D) 3 pair wings and 3 pair legs
 (1) A, B, C (2) A, C
 (3) C, D (4) B, C, D
28. Which of the following statements are correct about the fore wings in cockroach :-
 (1) They are mesothoracic
 (2) They are opaque, dark and leathery
 (3) They are not used in flight
 (4) All
29. In female cockroach ovary present in which abdominal segments ?
 (1) 4th to 6th (2) 2nd to 6th
 (3) 6th to 7th (4) 2nd to 4th
30. Given below the diagram of alimentary canal of cockroach. Identify a to e :-



- (1) (a) Pharynx, (b) Oesophagus, (c) Crop, (d) Rectum, (e) Colon
 (2) (a) Pharynx, (b) Oesophagus, (c) Mid-gut, (d) Colon, (e) Rectum
 (3) (a) Buccal cavity, (b) Oesophagus, (c) Mid-gut, (d) Colon, (e) Rectum
 (4) (a) Pharynx, (b) Oesophagus, (c) Gizzard, (d) Colon, (e) Rectum

31. In cockroach, how many times moulting occurs in metamorphosis ? (Nymph to adult)
 (1) 4 (2) 11 (3) 14 (4) 13
32. In cockroach a pair of spermatheca is present in the 6th segment which open into the which type of structure :-
 (1) Male gonopore (2) Seminal vesicle
 (3) Ejaculatory duct (4) Genital chamber
33. How many ovarioles present in each ovary of cockroach :-
 (1) 16 (2) 10 (3) 8 (4) 4
34. Which of the following statements is correct for cockroach ?
 (1) Malpighian tubules are excretory organs projecting out from the colon
 (2) Oxygen is transported by haemoglobin in blood
 (3) Nitrogenous excretory product is urea
 (4) The food is grinding by mandibles and gizzard

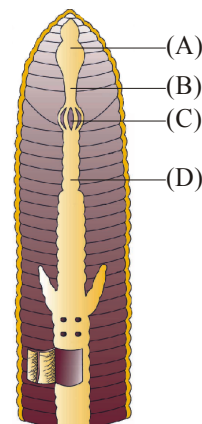
STRUCTURAL ORGANISATION OF ANIMAL (EARTHWORM)

- Pheretima* and its close relatives derive nourishment from :-
 (1) Sugarcane roots.
 (2) Decaying fallen leaves and soil organic matter.
 (3) Food grains.
 (4) House fly.
- Which of the following is incorrect for *Pheretima*?
 (1) Genital papillae are present on 17th and 19th segment.
 (2) Male genital pores are present on 18th segment.
 (3) Clitellum is present on segments 24, 25 and 26.
 (4) Segments of earthworm are called somites.
- The lateral hearts in earthworm have :-
 (1) Four pairs of valves and are situated in segments 7 and 9
 (2) Four pairs of valves and are situated in 6 and 9
 (3) Three pairs of valves and are situated in segments 8 and 10
 (4) Two pairs of valves and are situated in segments 7 and 11
- Blood vessel in *Pheretima*, which have valve is?
 (1) Dorsal (2) Ventral
 (3) Integumentary (4) Lateral
- One very special feature in the earthworm (*Pheretima*) is that :-
 (1) Fertilization of eggs occurs inside the body.
 (2) Typhlosole greatly increases the effective absorption area of intestine.
 (3) The S-shaped setae embedded in the integument are the defensive weapons used against the enemies.
 (4) It has a long dorsal tubular heart.
- Which one of the following structures in *Pheretima* is correctly matched with its function?
 (1) Clitellum – Secretes cocoon.
 (2) Gizzard – Absorb digested food.
 (3) Setae – Provides defence against predators.
 (4) Typhlosole – Storage of extra nutrients
- Which of the following structures is correctly matched with its description?
 (1) Septal nephridia and – Both are exonephric pharyngeal nephridia in earthworm.
 (2) Typhlosole – Helps in grinding the soil particles and decaying leaves in earthworm.
 (3) Hepatic caeca – Blind tubules present at the junction of foregut and mid-gut in the alimentary canal of cockroach.
 (4) Gizzard – Internal median fold present in the dorsal wall of the intestine of earthworm.
- Which of the following layers you will find in the body wall of earthworm (from outside to inside) ?
 (1) Non cellular cuticle, epidermis, circular muscle, longitudinal muscles, coelomic epithelium.
 (2) Cuticle, epidermis, longitudinal muscle, circular muscle, coelomic epithelium.
 (3) Non cellular cuticle, epidermis, coelomic epithelium, circular muscle, longitudinal muscle.
 (4) Cuticle, epidermis, peritoneal muscles.
- Given is the figure of alimentary canal of earthworm, select the option that correctly identifies the parts labelled as A to E :-


	A	B	C	D	E
(1)	Pharynx	Stomach	Intestinal Caecum	Gizzard	Lymph gland
(2)	Gizzard	Pharynx	Stomach	Intestinal Caecum	Lymph gland
(3)	Pharynx	Gizzard	Stomach	Intestinal Caecum	Lymph gland
(4)	Gizzard	Pharynx	Liver	Stomach	Villi

10. Which of the following statements is correct about excretion in earthworm ?
- Earthworm is mainly ureotelic.
 - Septal nephridia present on both sides of intersegmental septa of segment 15 to the last, open into intestine.
 - Integumentary nephridia, attached to lining of body wall of segment 3 to the last, open on the body surface.
 - Different types of nephridia are basically similar in structure.
 - Nephridia regulate the volume and composition of body fluids.
- (i) and (iv)
 - (iv) and (v)
 - (i), (ii), (iii)
 - All of these
11. Which type of nephridia in earthworm are present on both the side of inter segmental septa of segment 15th to last and open into intestine:-
- Pharyngeal
 - Septal
 - Integumentary
 - Both (2) & (3)
12. Earthworms have no skeleton but during burrowing the anterior end becomes turgid and acts as a hydraulic skeleton. It is due to :-
- Gut-movement
 - Setae
 - Heart-Pulsation
 - Coelomic fluid
13. In *Pheretima* there are red coloured round bodies in 4th, 5th and 6th segments above the alimentary canal they are believed to be involved in :-
- Excretion.
 - Reproduction.
 - Formation of blood cells and haemoglobin.
 - Digestion.
14. Body of cockroach is armoured with the chitinous plates, where as that of earthworm is without exoskeleton. What is true for the significance of this adaptation ?
- In cockroach this exoskeleton prevent moisture loss and entry of pathogens.
 - In earthworm phagocytic cells of coelomic fluid perform almost the same function.
 - In earthworm the presence of mucous rich surface compensates in respiration as well in locomotion.
 - All of the above.

15. Which part of the alimentary canal of earthworm (in the diagram) helps in grinding the soil particles and decaying leaves etc :-



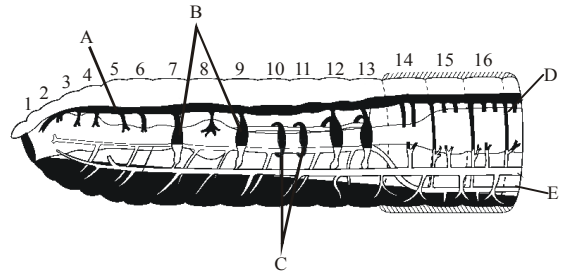
- A
 - B
 - C
 - D
16. Mark the **incorrect** statement for *Pheretima* :-
- Fertilization and development take place in cocoon.
 - Clitellum formed the cocoon on 14, 15 and 16 segments.
 - There is no larva stage i.e. development is direct.
 - Mouth is placed in first segment called prostomium.
17. In *Pheretima*, sperms belonging to the same earthworm is stored in :-
- Seminal vesicle.
 - Diverticulum of spermatheca.
 - Ampulla of spermatheca.
 - Prostate gland.
18. Arrange the external opening and their segmental numbers of *Pheretima* ?

List-I		List-II	
(A)	Male genital apertures	(1)	Between 12/13 to 119 segments
(B)	Mid-dorsal pore	(2)	4 th to 6 th segments
(C)	Spermathecal apertures	(3)	18 th segment
(D)	Pharyngeal nephridia	(4)	From 5/6 to 8/9 segments

- A = 2, B = 3, C = 1, D = 4
- A = 2, B = 1, C = 3, D = 4
- A = 3, B = 1, C = 4, D = 2
- A = 3, B = 4, C = 2, D = 1

19. In earthworm, the dorsal wall of the intestine (from the 27th segment to 95th segment) forms a median internal fold called :-
 (1) Blind duct (2) Clitellum
 (3) Typhlosole (4) Nephridia
20. The female-genital aperture in earthworm is present in which side of body ?
 (1) Ventro-lateral
 (2) Mid-ventral
 (3) Mid-dorsal
 (4) Mid-lateral
21. The function of blood glands in earthworm is:-
 (1) Maintenance of blood volume.
 (2) Maintenance of blood circulation.
 (3) Production of R.B.C.
 (4) Production of blood cells and haemoglobin.
22. In earthworm second layer of body wall is made up of :-
 (1) Collagen fibres
 (2) Fibrous connective tissue
 (3) Nervous tissue
 (4) Columnar epithelium cells.

23.



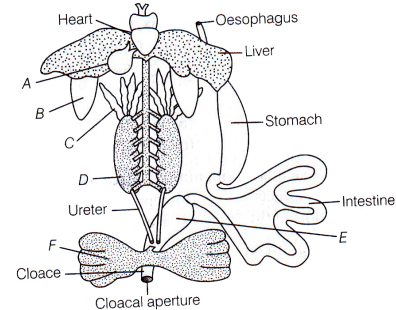
Go through the blood vascular system of earthworm, given in the following diagram and select the correctly matched code ?

	A	B	C	D	E
(1)	Dorsal vessel	Lateral hearts	Latero-oesophageal hearts	Ventral vessel	Anterior loops
(2)	Ventral vessel	Lateral hearts	Anterior loops	Dorsal vessel	Subneural vessel
(3)	Dorsal vessel	Latero-oesophageal hearts	Anterior loops	Commissural vessel	Ventral vessel
(4)	Dorsal vessel	Lateral hearts	Anterior loops	Commissural vessel	Subneural vessel

STRUCTURAL ORGANISATION OF ANIMAL (FROG)

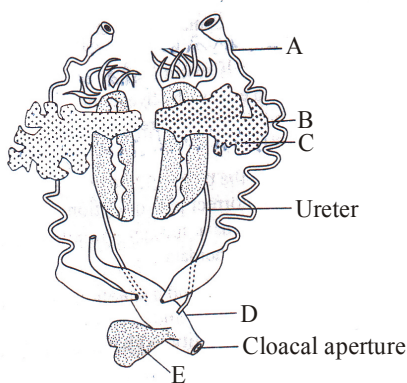
- Which of the following exhibits sexual dimorphism?
 - Frog
 - Leech
 - Earthworm
 - Taenia*
- Male frog can be distinguished from female frog due to the presence of :-
 - Presence of vocal sacs and copulatory pad on the first digit of the forelimb.
 - a neck and tail is absent.
 - five digits in hind limbs
 - eyes are bulged and covered by the nictitating membrane.
- The frogs have the ability to change its colour to hide them from their enemies. This protective colouration is called :-
 - hibernation
 - aestivation
 - camouflage
 - morphallaxis
- The skin of frog is slippery and smooth due to the presence of :-
 - mucus
 - gelatin
 - waxy skin
 - sebum
- For capturing the prey frog uses its :-
 - lips
 - teeth
 - tongue
 - hand
- The alimentary canal of frog is short because frog is :-
 - herbivore
 - carnivore
 - omnivore
 - heterotroph
- In frog, for the digestion of food, walls of the stomach secrete :-
 - pepsin and renin
 - amylase and tryptophanase
 - HCl and gastric juice
 - HCl and pepsin
- In frog, excess of the bile juices secreted by the liver is stored in :-
 - intestine
 - pancreas
 - gall bladder
 - rectum

- Given below the diagram of internal organs of frog. Identify A to F



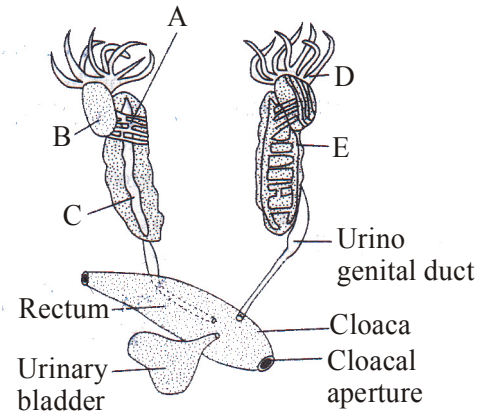
- A–Gall bladder, B–Lungs, C–Testis, D–Kidney, E–Urethra, F–Urinary bladder
 - A–Gall bladder, B–Lungs, C–Fat bodies, D–Kidney, E–Rectum, F–Urinary bladder
 - A–Gall bladder, B–Lungs, C–Ovary, D–Kidney, E–Ileum, F–Urinary bladder
 - A–Gall bladder, B–Lungs, C–Fat bodies, D–Kidney, E–Colon, F–Urinary bladder
- In frog, cloaca is an opening of :-
 - excretory ducts
 - reproductive ducts
 - Digestive tract
 - All of these
 - The frog is :-
 - Ureotelic animal
 - Ammonotellic animal
 - Ureotelic animal
 - Amminotelic animal
 - Bidder's canal is present in :-
 - testes of frog
 - kidney of male frog
 - kidney of female frog
 - ovary of female frog
 - The number of pairs of cranial nerves arising from the brain of frog is :-
 - 10
 - 9
 - 8
 - 7

14. Observe the following figure of female reproductive system of frog and identify A to E.



- (1) A–Urinary duct, B–Ova, C–Ovary, D–Cloaca, E–Urethra
- (2) A–Oviduct, B–Ovary, C–Ova, D–Cloaca, E–Urinary bladder
- (3) A–Oviduct, B–Ovary, C–Ova, D–Rectum, E–Adrenal gland
- (4) A–Urinogenital duct, B–Ovary, C–Ovum, D–Coelom, E–Urethra

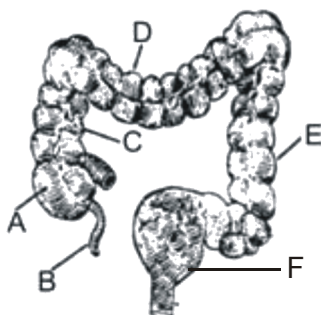
15. Identify A, B, C, D and E in the given figure of male reproductive system of frog.



- (1) A–Fat bodies, B–Testis, C–Ureters, D–Vasa efferentia, E–Kidney
- (2) A–Nephrons, B–Testis, C–Ureters, D–Villi, E–Kidney
- (3) A–Vasa efferentia, B–Testis, C–Adrenal gland, D–Fat bodies, E–Kidney
- (4) A–Mesorchium, B–Testis, C–Adrenal gland, D–Fat bodies, E–Kidney

DIGESTION AND ABSORPTION # 01 (ANATOMY OF ALIMENTARY CANAL)

1. The diagram of large intestine of human is given below. Identify the parts A, B, C, D, E and F



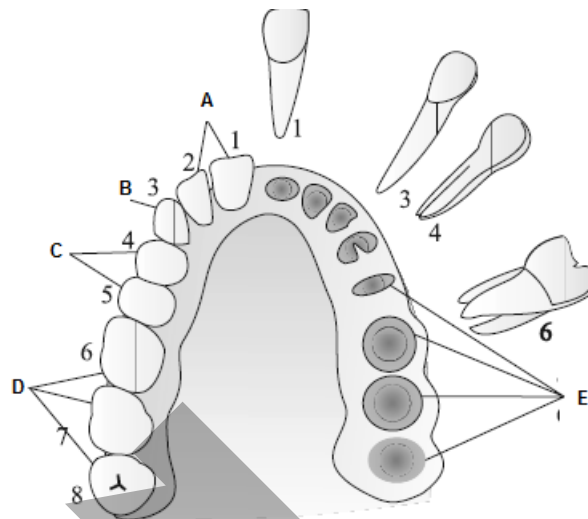
	A	B	C	D	E	F
1	Caecum	appendix	Ascending colon	transverse colon	Descending colon	Sigmoid colon
2	Sigmoid colon	caecum	appendix	Ascending colon	transverse colon	Descending colon
3	Caecum	appendix	Ascending colon	transverse colon	Descending colon	Rectum
4	Caecum	appendix	Ascending colon	transverse colon	Sigmoid colon	Descending colon

2. Which of the following statements are correct?

- (a) Caecum is a small blind sac which hosts some symbiotic microorganisms.
(b) Duodenum is the longest part of small intestine.
(c) The tongue is a freely movable muscular organ attached to the floor of the oral cavity by the frenulum.
(d) The process of conversion of complex food molecules into smaller absorbable form is called absorption.

- (1) a , b (2) a , c
(3) b , d (4) a , d

3. Identify A , B , C , D and E in the given diagram of arrangement of teeth



	A	B	C	D	E
1	Incisors	Canines	premolars	molars	Sockets of jaw
2	Incisors	premolars	Molars	Canines	Sockets of jaw
3	canines	Incisors	Premolars	Molars	Sockets of jaw
4	Incisors	Canines	Molars	Premolars	Sockets of jaw

4. Which of the following statement is correct?
(1) duodenum is the longest part of small intestine
(2) caecum continues into colon which is the initial part of the small intestine
(3) rectum opens into anal canal
(4) internal anal sphincter is voluntary and external anal sphincter is involuntary

5. Three major type of cells in stomach are
 (1) mucous cells, chief cells, oxyntic cells
 (2) mucous cells, chief cells, enteroendocrine cells
 (3) mucous cells, enteroendocrine cells, oxyntic cells
 (4) enteroendocrine cells, chief cells, oxyntic cells
6. Which of the following is not the characteristic feature of human teeth?
 (1) thecodont (2) diphyodont
 (3) heterodont (4) polyphyodont
7. Match the following columns and choose the correct answer from the options given below

	Column A		Column B
A	Incisors	i	Gnawing of food
B	Canines	ii	Sharp , pointed
C	Premolars	iii	Chewing of food
D	Molars		

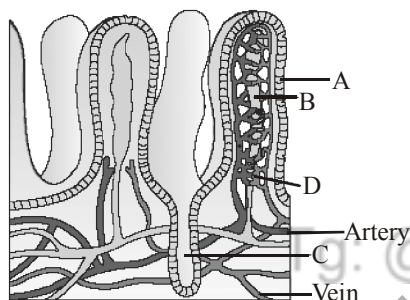
	A	B	C	D
1	i	ii	iii	iii
2	i	iii	ii	iii
3	i	ii	i	iii
4	iii	i	ii	iii

8. _____ covers the opening of the internal nasal pores during ingestion of food. So food particle cannot move inside nasal chamber.

- (1) Uvula (2) Palate
 (3) Tonsils (4) Buccal vestibule

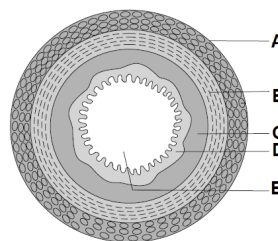
DIGESTION AND ABSORPTION # 02 (HISTOLOGY OF ALIMENTARY CANAL)

- Aggregates of lymphoid tissue present in the small intestine are known as :-
 (1) Villi (2) Rugae
 (3) Choroid plexus (4) Peyer's patches
- Which of the following is not present in the mucosa of intestine ?
 (1) Crypts of lieberkuhn
 (2) Brunner's gland
 (3) Intestinal gland
 (4) Goblet cells
- The diagram given below represents a section of small intestinal mucosa showing villi. Identify A, B, C and D :-



- (1) A - Villi, B - Lacteal, C - Capillaries, D - Crypts
 (2) A - Lacteal, B - Villi, C - Capillaries, D - Crypts
 (3) A - Villi, B - Lacteal, C - Crypts, D - Capillaries
 (4) A - Crypts, B - Lacteal, C - Capillaries, D - Villi
- Stomach is characterised by
 (a) Multilayered epithelium
 (b) Oblique muscle layer
 (c) Brunner's glands in submucosa
 (d) Paneth cells in mucosa
 (1) a and b only (2) b and c only
 (3) d only (4) b only

- Label A, B, C, D and E in the given diagrammatic representation of transverse section of gut.



	A	B	C	D	E
1	serosa	muscularis	submucosa	mucosa	lumen
2	mucosa	muscularis	submucosa	Serosa	lumen
3	mucosa	submucosa	Muscularis	serosa	lumen
4	serosa	submucosa	muscularis	mucosa	lumen

- Aggregates of lymphoid tissue present in the distal portion of the small intestine are known as :-
 (1) villi
 (2) Peyer's patches.
 (3) rugae.
 (4) choroid plexus.
- Which cells of Crypts of Lieberkuhn secrete antibacterial lysozyme ?
 (1) Paneth cells (2) Zymogen cells
 (3) Kupffer cells (4) Argentaffin cells
- Match the following

	COLUMN (A)		COLUMN (B)
A	Mucosa	i	Bases of villi
B	Villi	ii	Small intestine
C	Submucosa	iii	Villi and rugae
D	Crypts	iv	Nerves, blood and lymphatic vessels

- (1) A – ii, B – iii, C – i, D – iv
 (2) A – i, B – iv, C – ii, D – iii
 (3) A – iii, B – ii, C – iv, D – i
 (4) A – ii, B – iii, C – iv, D – i

DIGESTION AND ABSORPTION # 03 (DIGESTIVE GLANDS)

1. Find out the correct match from the following table:-

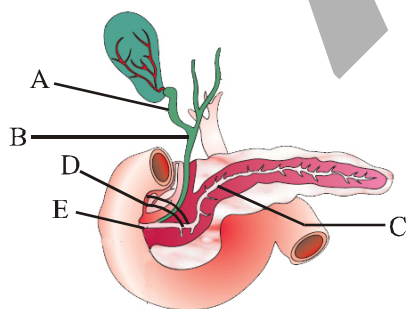
	Column-I	Column-II	Column-III
(i)	Ptyalin enzyme	Salivary gland	Protein digesting enzyme
(ii)	Pepsin	Gastric gland	Protein digesting enzyme
(iii)	Amylase	Pancreas	Fat digesting enzyme

Options :-

- (1) Only (i) (2) (i) & (ii) both
(3) Only (ii) (4) (ii) & (iii) both
2. Which of the following is a wrong match in the given table?

		Parotid gland	Submaxillary gland	Sublingual gland
1	Location	Below ear	Jaw angle	Below tongue
2	Number	One pair	One pair	One pair
3	Duct	Stenson's duct	Wharton's duct (smallest duct)	Duct of Rivinus (longest duct)
4	Secretion	Saliva + enzyme	Saliva	saliva

3. Find out the correct match in the given diagram



	A	B	C	D	E
1	Cystic duct	Common bile duct	Duct of Wirsung	Duct of Santorini	Sphincter of Oddi
2	Cystic duct	Common bile duct	Duct of Wirsung	Sphincter of Boyden	Sphincter of Oddi
3	Cystic duct	Common bile duct	Duct of Wirsung	Sphincter of Oddi	Sphincter of Boyden
4	Common bile duct	Cystic duct	Duct of Wirsung	Sphincter of Boyden	Sphincter of oddi

4. There are five statements given below about the liver. How many of them are correct?
- (a) Largest gland of the body
(b) Known as the chemical and biological factory of the body
(c) Gall bladder is situated just below the left lobe of the liver
(d) Secretes bile juice which helps in emulsification of fats
(e) Liver store fats in large amount
- (1) four (2) Three (3) Two (4) One
5. From the following relationships between secretory materials and their source, mark the correct option
- (a) salivary gland —salivary amylase
(b) stomach—trypsin
(c) pancreas—pepsin
(d) liver —bile juice
- (1) a—correct , b — incorrect , c— incorrect , d— correct
(2) a—correct , b — correct , c— incorrect , d— correct
(3) a—incorrect , b— incorrect , c— incorrect, d— correct
(4) a—incorrect , b — correct , c— incorrect , d— correct

6. Which of the following options best represents the enzyme composition of pancreatic juice?

- (1) amylase, pepsin, trypsinogen, maltase
- (2) peptidase, amylase, pepsin, rennin
- (3) lipase, amylase, trypsinogen, procarboxypeptidase
- (4) amylase, peptidase, trypsinogen, rennin

7. A young infant may be feeding entirely on mothers milk which is white in color but the stool which the infant passes out is quite yellowish. What is this yellow color due to :-

- (1) pancreatic juice poured into duodenum.
- (2) intestinal juice.
- (3) bile pigments.
- (4) undigested milk protein casein.

8. A person addicted for alcohol gets his liver destroyed because :-

- (1) liver store excess of protein
- (2) liver store excess of fat
- (3) liver store excess of starch
- (4) liver store excess of glycogen

9. Match the following columns and choose correct option.

COLUMN (A)		COLUMN (B)	
1	Saliva	A	Bilirubin, biliverdin, cholesterol
2	Gastric juice	B	Pepsinogen, prorennin, lipase
3	Bile juice	C	Ptyalin, electrolyte
4	Pancreatic juice	D	Dipeptidase, maltase, sucrase, lactase, lipase, nucleotidase, nucleosidase
5	Succus entericus	E	Trypsinogen, chymotrypsinogen, procarboxypeptidase

(1) 1 – C, 2 – A, 3 – B, 4 – D, 5 – E

(2) 1 – A, 2 – B, 3 – C, 4 – D, 5 – E

(3) 1 – C, 2 – B, 3 – A, 4 – D, 5 – E

(4) 1 – C, 2 – B, 3 – A, 4 – E, 5 – D

DIGESTION AND ABSORPTION # 04 (DIGESTION OF FOOD)

- Which of the following enzymes of intestinal juice does not have direct role in digestion of nutrients ?
(1) Dipeptidase (2) Erepsin
(3) Enterokinase (4) Maltase
- Which of the following reactions is not catalysed by a brush border enzyme ?
(1) Maltose $\xrightarrow{\text{Maltase}}$ glucose + glucose
(2) Lactose $\xrightarrow{\text{Lactase}}$ glucose + galactose
(3) Starch $\xrightarrow{\text{Amylase}}$ disaccharide
(4) Nucleotides $\xrightarrow{\text{Nucleotidase}}$ Nucleoside
- The sequence of pH in different parts of alimentary canal, starting from stomach is :-
(1) Alkaline $\longrightarrow$ Acidic $\longrightarrow$ Alkaline
(2) Acidic $\longrightarrow$ Alkaline $\longrightarrow$ Alkaline
(3) Acidic $\longrightarrow$ Acidic $\longrightarrow$ Alkaline
(4) Alkaline $\longrightarrow$ Alkaline $\longrightarrow$ Acidic
- Mixture of food with saliva is called _____ whereas mixture of food with gastric juice is called _____.
(1) chyme, bolus (2) chyme, chyle
(3) bolus, chyle (4) bolus, chyme
- Which of the following is incorrect?
(1) Sucrose is converted into glucose and fructose in the presence of sucrase.
(2) Maltose produces two molecules of glucose in the presence of maltase.
(3) Lactose is converted into galactose and fructose in the presence of lactase.
(4) Nucleotides are converted into nucleosides and phosphate group in the presence of nucleotidases.

- This enzyme is present in childhood stage of mammals only. It convert milk into curd like substance and then digests it. In adults, it is absent. This enzyme is
(1) Renin (2) Ptyalin
(3) Trypsin (4) Rennin
- Which one of the following is the correct match of the site of the action on the given substrate, the enzyme acting upon it and the end product?
(1) **Duodenum** : Triglycerides $\xrightarrow{\text{Trypsin}}$ Fatty acid.
(2) **Small intestine** : protein $\xrightarrow{\text{Pepsin}}$ Amino acid.
(3) **Stomach** :
Nucleic acid $\xrightarrow{\text{Nuclease}}$ nucleotide.
(4) **Small intestine** :
Dipeptides $\xrightarrow{\text{Dipeptidase}}$ Amino acids.
- Match the column I with column II, and choose the correct option

Column-I		Column-II	
(A)	Secretin	(1)	Stimulate the secretion from gastric glands
(B)	Gastrin	(2)	Stimulate the secretion of water & bicarbonates in pancreatic Juice
(C)	CCK	(3)	Inhibit gastric secretion & motility
(D)	GIP	(4)	stimulate the release of bile from gall bladder

- (1) A-1, B-2, C-3, D-4
- (2) A-2, B-1, C-4, D-3
- (3) A-4, B-1, C-2, D-3
- (4) A-3, B-2, C-4, D-1

DIGESTION AND ABSORPTION # 05 (ABSORPTION OF DIGESTED FOOD)

- During fat absorption, chylomicrons are formed in :-
 (1) Lymph vessel (2) Intestinal cell
 (3) Lumen of intestine (4) Blood stream
- Absorption of digested lipids from the lumen of small intestine to the intestinal walls takes place in the form of :-
 (1) Micelles (2) Bolus
 (3) Chyle (4) Chyme
- Water is absorbed into the blood through mucosa cells of intestine by :-
 (1) Active transport
 (2) Osmosis
 (3) Simple diffusion
 (4) Co-transport mechanism
- Stomach is the site of absorption of :-
 (1) Simple sugars (2) Water
 (3) Alcohol (4) All of these
- Vitamin B₁₂ is absorbed by the help of secretions of which cells of stomach ?
 (1) Goblet cells (2) Parietal cells
 (3) Peptic cells (4) Chief cells

- Which of the following does not enter into hepatic portal circulation?
 (1) Fats (2) Proteins
 (3) Carbohydrates (4) minerals
- Vein through which food molecules goes towards liver is called :-
 (1) hepatic vein (2) hepatic portal vein
 (3) lateral vein (4) iliac vein
- Find out the **incorrect** match from the table of the summary of absorption in different parts of digestive system given below

	Digestive part	Summary of absorption
1	Mouth & baccal cavity	Certain proteins comes in contact of mucosa of mouth and upper side of tongue are absorbed into blood capillaries lining them
2	Stomach	Absorption of water , simple sugars and alcohol etc
3	Small intestine	Principal organ of absorption of nutrients
4	Large intestine	Absorption of water , some minerals and drugs

DIGESTION AND ABSORPTION # 06 (DISORDERS)

- Which of the following diseases is caused due to deficiency of vitamin A ?
(1) Night blindness (2) Pellagra
(3) Beri beri (4) Cheilosis
- Find the correct match :-
(1) Diarrhoea – Retention of faeces in rectum
(2) Jaundice – Skin and eyes turn yellow due to excess deposition of bile salts.
(3) Marasmus – Oedema, pot belly and diarrhoea.
(4) Beri beri – Deficiency of vitamin B₁
- When skin and eyes turn yellow, it is the symptom of :-
(1) Vomiting (2) Diarrhoea
(3) Jaundice (4) Constipation
- Feeling that precedes vomiting is :-
(1) Nausea
(2) Anxiety
(3) Vertigo
(4) Depression
- Which of the following is not related to Marasmus ?
(1) Subcutaneous fat is not preserved
(2) Oedema is absent
(3) Ribs become very prominent
(4) Deficiency of protein only

- Mark the condition where food is not properly digested leading to feeling of fullness. This can be caused due to inadequate secretion, food poisoning, overeating etc.
(1) Vomiting (2) Constipation
(3) Indigestion (4) Diarrhoea

- Match the following columns and choose the correct answer from the options given below:-

(a)	indigestion	(i)	ejection of stomach contents through mouth
(b)	constipation	(ii)	it reduces the absorption of food
(c)	diarrhoea	(iii)	the faeces are retained within the rectum as the bowel movements occurs irregularly.
(d)	vomiting	(iv)	food is not properly digested

	A	B	C	D
(1)	i	ii	iv	iii
(2)	i	ii	iii	iv
(3)	iv	iii	i	ii
(4)	iv	iii	ii	i

- Which of the following are not the incorrect symptoms of the Kwashiorkor?
(1) underweight , stunted growth , chelosis , poor brain development
(2) underweight , stunted growth , poor brain development, anaemia
(3) underweight , stunted growth , loss of appetite, keratitis
(4) underweight , stunted growth , poor brain development , glossitis

EXCRETORY PRODUCTS AND THEIR ELIMINATION # 01
(INTRODUCTION AND EXCRETORY ORGANS)

- Which of the given members are ammonotelic?
(1) Star fish, tadpole larva of frog
(2) Amoeba, Hydra, Frog
(3) Frog, Jelly fish, Cockroach
(4) Sponge, Cartilaginous fish, Human
- Osmoconformers are those animals which :-
(1) Change the osmolarity of their body fluids according to the osmolarity of the medium in which they live.
(2) Do not control osmotic concentration of their body fluids.
(3) Include fresh water invertebrates, some marine invertebrates and Hag fish.
(4) All of these are correct
- Which of the following is matching set of organism and its excretory structure ?

	Organism	Excretory structure
(1)	Scorpions and spiders	Antennal glands
(2)	Cockroach	Protonephridia
(3)	Crustaceans like prawns	Green gland
(4)	Amphioxus	Kidney

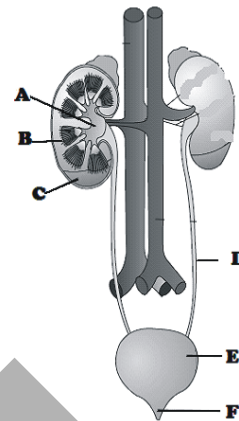
- Which of the following group of animals are ammonotelic in nature ?
(1) Marine Fishes, amphibians, aquatic insects
(2) Mammals, birds, Reptiles
(3) Many bony fishes, aquatic amphibians, aquatic insects.
(4) All the above
- Which is not correctly matched ?
(1) Malpighian tubules - Cockroaches, Mosquito
(2) Antennal glands - *Planaria*, Crab
(3) Nephridia - Earthworm, *Neries*
(4) Protonephridia - *Amphioxus*, *Taenia*
- Identify the wrong combination
(a) Green glands - Crustacean - ureotelic
(b) Malpighian tubule - Insect - uricotelic
(c) Nephridia - Annelida - uricotelic
(d) Flame cells - Aschelminthes - ammonotelic
(1) a, b, c (2) a, c, d
(3) b, c, d (4) a, b, d
- A ten years child takes large amount of proteins. He is likely to excrete a greater amount of
(1) urea (2) uric acid
(3) ammonia (4) amino acids

EXCRETORY PRODUCTS AND THEIR ELIMINATION # 02
(HUMAN KIDNEY AND POST RENAL URINARY TRACT)

- Each human kidney has nearly :-
(1) 10,000 nephrons
(2) 50,000 nephrons
(3) 1,00,000 nephrons
(4) 10,00,000 nephrons
- Detrusor muscles are present mainly in :-
(1) Coat of kidney
(2) Muscular coat of urinary bladder
(3) Renal fascia of kidney
(4) Cortex of kidney
- The medulla of the kidney is divided into few conical masses known as a projected into b :-
(1) a – Calyces, b – Medullary pyramid
(2) a – Medullary pyramid, b – Calyces
(3) a – Loop of Henle, b – Calyces
(4) a – Renal pelvis, b – Ureter
- Identify the statements as true (T) or false (F) and choose the correct option :-
a. The kidney is covered by an outer tough renal capsule.
b. Renal medulla is divided into conical masses called minor calyces.
c. The cortex extends in between the medullary pyramids which is called as columns of Bertini.
d. Blood in renal artery has more urea in comparison to blood in renal vein.

	a	b	c	d
(1)	T	F	T	T
(2)	T	T	T	F
(3)	F	T	T	T
(4)	T	T	F	T

- Identify A , B , C and D, E and F in the given diagram ?

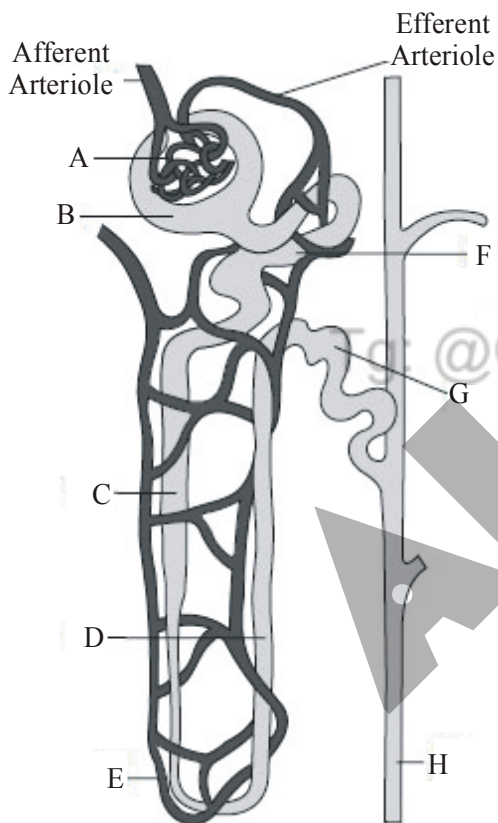


	A	B	C	D	E	F
1	Pelvis	Cortex	Medulla	Urethra	Urinary bladder	Urethra
2	Pelvis	Medulla	Cortex	Urethra	Urinary bladder	Ureter
3	Pelvis	Medulla	Cortex	Ureter	Urinary bladder	Urethra
4	Pelvis	Cortex	Medulla	Ureter	Urinary bladder	Urethra

- In humans the excretory system consist of
(1) one pair of kidneys , one pair of ureter , a urinary bladder and a urethra
(2) one pair of kidneys , one pair of ureter , a pair of urinary bladder and a urethra
(3) one pair of kidneys , one pair of ureter , a urinary bladder and a pair of urethra
(4) one pair of kidneys , a ureter , a urinary bladder and a urethra
- A notch in the bean shaped kidney is called
(1) calyx (2) papilla
(3) pyramid (4) hilum
- Which of the following is not the function of the kidneys ?
(1) regulation of blood volume
(2) synthesis of glucose
(3) participation in vitamin D synthesis
(4) regulation of blood pH

**EXCRETORY PRODUCTS AND THEIR ELIMINATION # 03
(NEPHRON AND BLOOD FLOW IN KIDNEY)**

- Renal vein transport blood in which direction?
(1) Inferior venacava to kidney
(2) Kidney to inferior venacava
(3) Inside kidney toward afferent renal arteriole
(4) From hind limb to kidney
- Duct of Bellini opens into
(1) collecting duct (2) DCT
(3) Ureter (4) Renal papilla
- The given figure of nephron showing blood vessels and duct. Select the right answer



Which part are lined by simple squamous epithelium?

- (1) B and E
- (2) B and G
- (3) B and C
- (4) B and H

- Which of the following is not present in medullary pyramids?
(1) Loop of Henle
(2) peritubular capillaries
(3) PCT and DCT
(4) Collecting ducts
- Which of the following is not a part of nephron?
(1) Bowmans capsule
(2) Loop of Henle
(3) Collecting duct
(4) Distal convoluted tubule
- The number of renal papilla in a kidney
(1) equal to the renal pyramids
(2) half of the renal pyramids
(3) double of the renal pyramids
(4) equal to the number of nephrons
- Which of the following blood vessel contain minimum amount of urea?
(1) dorsal aorta
(2) renal vein
(3) renal artery
(4) hepatic artery
- Which type of tissue is found in PCT and collecting duct?
(1) simple cuboidal brush border and simple squamous
(2) simple cuboidal brush border and simple columnar
(3) simple cuboidal brush border and simple cuboidal
(4) simple cuboidal and simple squamous

EXCRETORY PRODUCTS AND THEIR ELIMINATION # 04
(PHYSIOLOGY OF URINE FORMATION)

- Which statement is true regarding reabsorption.
 - Nearly 99 percent of the filtrate has to be reabsorbed by the renal tubules.
 - Nearly all of the essential nutrients are reabsorbed by PCT.
 - DCT is also capable of reabsorption of HCO_3^-
 - All the above
- Glucose, amino acids and 75% water are reabsorbed in
 - proximal convoluted tubule
 - distal convoluted tubule
 - collecting duct
 - Loop of Henle
- Which part of nephron is responsible for conditional reabsorption of water and Na^+ ?
 - Proximal convoluted tubule
 - loop of Henle
 - Distal convoluted tubule
 - Bowmans capsule
- If the diameter of afferent arteriole is less than the diameter of efferent arteriole, ultrafiltration will
 - be faster
 - be slower
 - not take place
 - no effect on ultrafiltration
- Reabsorption of Chloride ions from glomerular filtrate in kidney tubule occur by
 - active transport
 - simple diffusion
 - osmosis
 - Brownian movement

- The tubular epithelial cells in different segments of nephron perform reabsorption either by active or passive mechanisms. For example , substances like glucose , amino acids , Na^+ etc. in the filtrate are reabsorbed _____A_____ whereas the nitrogenous wastes are absorbed by _____B_____

	A	B
1	Actively	Passive transport
2	Passively	Active transport
3	Activley	Facilitated diffusion
4	Facilitated diffusion	Actively

- Which of the following is not the feautre for renal corpuscle that enhance its filtering capacity?
 - large glomerular capillary surface area
 - thick , selectively permeable filtering membrane
 - high glomerular capillary pressure
 - messangial cells regulating the filtering surface area.
- Given are the following values, calculate the net filtration pressure
 - GHP = 50 mmHg
 - CHP = 15 mmHg
 - BCOP = 35 mmHg
 - 30 mmHg
 - 0 mmHg
 - 30 mmHg
 - 70 mmHg

EXCRETORY PRODUCTS AND THEIR ELIMINATION # 05
(REGULATION OF KIDNEY FUNCTION, MICTURITION, ROLE OF OTHER
ORGANS IN EXCRETION, HEMODIALYSIS AND DISEASES)

- Find out the **correct** statement :
 - An increase in body fluid volume stimulate the ADH release.
 - A fall in glomerular blood flow can activate the JG cells to release renin.
 - Angiotensin-II, being a powerful vasodilator, decreases the glomerular blood pressure.
 - Decrease in blood flow to the atria of the heart can cause the release of atrial natriuretic factor (ANF)
- Select the correct option with the reference of hemodialysis
 - when nitrogenous waste concentration is high in blood then nitrogenous waste are removed by hemodialysis
 - anticoagulant like heparin used during hemodialysis
 - it can also be used for removal of ketone bodies from blood.
 - all of the above
- Match the disorders given in column I with their feature given in column II and choose the correct option
- Which of the following not takes place when there is a fall in glomerular filtration rate ?
 - posterior pituitary to release vasopressin
 - juxtaglomerular cells to release renin
 - adrenal medulla to release adrenaline
 - adrenal cortex to release aldosterone
- Micturition is
 - removal of urea from blood
 - removal of uric acid
 - passing out urine
 - removal of faecal matter
- Osmoreceptors in the body are activated by
 - changes in blood volume
 - changes in body fluid volume
 - changes in ionic concentration
 - all of the above
- The primary function of sweat is
 - removal of nitrogenous waste from body
 - removal of sebum from the body
 - to facilitate a cooling effect on the body surface
 - removal of electrolytes from body
- Micturition is the term applied to the movement of urine out of the
 - Bowmans capsule
 - Renal pelvis
 - Ureters
 - Urinary bladder

	Column (I)		Column (II)
(A)	Uremia	I	Excess of proteins in urine
(B)	Hematuria	II	Presence of ketone bodies in urine
(C)	Ketonuria	III	Presence of blood cells in urine
(D)	Glycosuria	IV	Presence of glucose in urine
(E)	Proteinuria	V	Excess of urea in blood

- A-V , B-III , C -II , D-IV , E-I
- A-III , B-V , C -II , D-IV , E-I
- A-I , B-III , C -II , D-IV , E-V
- A-V , B-II , C -III , D-IV , E-I

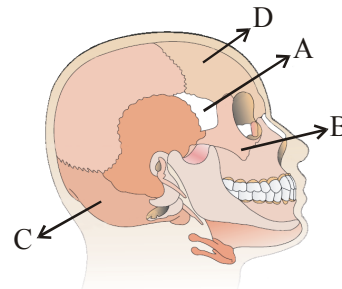
LOCOMOTION AND MOVEMENT - I (SKELETAL SYSTEM) # 01 (SKULL)

- The human skull has 22 bones with _____ cranial bones and _____ facial bones :-
(1) 10, 12 (2) 14, 8 (3) 12, 10 (4) 8, 14
- Which of the following is not a cranial bone ?
(1) Zygomatic (2) Sphenoid
(3) Ethmoid (4) Parietal
- Which one is a bone of skull ?
(1) Atlas (2) Femur
(3) Tibia (4) Frontal
- Out of the following bones, how many bones are of cranium ?
Frontal, Sphenoid, Ethmoid, Lacrimal, Nasal, Zygomatic, Maxilla and Hyoid
(1) Three (2) Four (3) Five (4) Six
- Match the column I and II and select the correct option? [These number of bones are related with human] :-

	Column I		Column II
A	Number of cranial bones	i	14
B	Number of total bones in body	ii	24
C	Number of facial bones	iii	08
D	Number of bones in axial skeleton	iv	206
E	Number of ribs	v	80
		vi	126

- (1) A-ii, B-vi, C-i, D-v, E-ii
- (2) A-iii, B-vi, C-ii, D-v, E-i
- (3) A-iii, B-iv, C-i, D-v, E-ii
- (4) A-i, B-iv, C-ii, D-vi, E-iii

- Given below the diagrammatic view of human skull in which certain bones are labelled by A, B, C and D. Find out the correct option in which all the alphabetise are correctly labelled :-



Option :-

	A	B	C	D
(1)	Zygomatic bone	Sphenoid bone	Temporal bone	Frontal bone
(2)	Sphenoid bone	Maxilla bone	Occipital bone	Parietal bone
(3)	Sphenoid bone	Zygomatic bone	Occipital bone	Frontal bone
(4)	Zygomatic bone	Maxilla bone	Temporal bone	Parietal bone

- Foramen magnum is present in :-
(1) Base of skull
(2) Base of spinal cord
(3) Base of pelvic girdle
(4) Base of vertebral column
- Manubrium is a part of :-
(1) Skull (2) Sternum
(3) Pelvic girdle (4) Sacrum

LOCOMOTION AND MOVEMENT - I (SKELETAL SYSTEM) # 02
(VERTEBRAL COLUMN)

1. Choose the odd one out w.r.t. the functions of vertebral column :-
 - (1) Protects spinal cord
 - (2) Supports head
 - (3) Forms lymph
 - (4) Serve as the point of attachment for ribs and musculature of the back.
2. An adult human vertebral column is formed by _____ serially arranged units called vertebrae and is _____ placed.
 - (1) 33, dorsally (2) 26, dorsally
 - (3) 20, ventrally (4) 45, ventrally
3. Each vertebra has a central hollow portion through which spinal cord passes. This hollow portion of vertebra is called :-
 - (1) Neural canal (2) Central canal
 - (3) Foramen magnum (4) Foramen ovale
4. Number of vertebrae present in thoracic, cervical, lumbar, sacral and coccyx regions are respectively :-
 - (1) 12, 7, 5, 1, 1 (2) 1, 7, 5, 12, 1
 - (3) 7, 12, 5, 1, 1 (4) 5, 12, 7, 1, 1
5. Intervertebral discs are :-
 - (1) Cartilaginous
 - (2) Made of muscles only
 - (3) Bony
 - (4) Made up of CaCO_3
6. Read the following statements A-D
 - A. Our vertebral column is formed by 26 serially arranged units called vertebrae and is ventrally placed.
 - B. Vertebral column extends from the base of the skull and constitutes the main frame work of the trunk.
 - C. Each vertebra has a central hollow portion (neural canal) through which the spinal cord passes.
 - D. First vertebra is axis and it articulates with the occipital condyles
 How many of the above statements are correct?
 - (1) Four (2) Three (3) Two (4) One
7. In human being, the total number of thoracic vertebrae are
 - (1) 7 (2) 12 (3) 5 (4) 10
8. First human vertebrae is :
 - (1) Axis (2) Atlas
 - (3) Lumbar (4) Sacrum

LOCOMOTION AND MOVEMENT - I (SKELETAL SYSTEM) # 03
(RIBS AND STERNUM)

1. All the ribs are attached to :-
 (1) Sternum (2) Vertebral column
 (3) Clavicle (4) Ilium
 2. The costal cartilage of vertebrochondral ribs are attached with :-
 (1) Sternum (2) Vertebrosteral rib
 (3) Thoracic vertebrae (4) Not attached
 3. Which one is anatomically incorrect ?
 (1) Vertebrochondral ribs – Last 2 pairs (11th and 12th ribs)
 (2) Floating ribs – 2 pairs
 (3) Vertebrosteral ribs – 7 pairs
 (4) False ribs – 8th, 9th and 10th pairs
 4. Read the following statements (A to D) :-
 A. There are 12 pairs of ribs
 B. Each rib is a thin flat bone connected ventrally to the vertebral column and dorsally to the sternum
 C. First seven pairs of ribs are called vertebrochondral ribs
 D. The 8th, 9th and 10th pairs of ribs do not articulate directly with the sternum but join the seventh rib with the help of hyaline cartilage.
- How many of the above statements are correct?
 (1) Four (2) Three
 (3) Two (4) One
5. Which pairs of ribs are known as **false** ribs?
 (1) 7th, 8th and 9th pairs
 (2) 8th, 9th and 10th pairs
 (3) 1st, 2nd and 3rd pairs
 (4) 5th, 6th and 7th pairs
 6. The pairs of Ribs which articulate directly with sternum are :-
 (1) 1st to 7th (2) 7th, 8th, 9th
 (3) 8th, 9th, 10th (4) 11th, 12th
 7. The false ribs are attached to the 7th rib with the help of :-
 (1) Yellow elastic cartilage
 (2) White fibrous cartilage
 (3) Calcified cartilage
 (4) Hyaline cartilage

LOCOMOTION AND MOVEMENT - I (SKELETAL SYSTEM) # 04
(APPENDICULAR SKELETON)

- Which of the following statements is wrong ?
(1) Axial skeleton comprises 80 bones
(2) Each coxal bone is formed by the fusion of ilium, ischium and pubis.
(3) Vertebral column is formed by 33 fused vertebrae.
(4) Sternum is a flat bone on the ventral midline of thorax.

- Which of the following is **correct** match of bones?

	Bones	Position	Number
1.	Carpals	Wrist	12
2.	Metacarpals	Palm	7
3.	Phalanges	Digits	14
4.	Tarsals	Ankle	8

- Read the following statements and select the correct option with regard to pelvic girdle ?
(A) It consists of two coxal bones.
(B) Each coxal bone is formed by the fusion of ilium, ischium and pubis.
(C) Ilium bone has a cavity called glenoid cavity.
(D) The two halves of the pelvic girdle meet dorsally to form the pubic symphysis.

Option :-

- Statements A, B and C correct while D is incorrect
- Statements A and B are correct while C and D are incorrect
- Statement A and B are incorrect while C and D are correct
- Only statement A is correct while B, C and D are incorrect

- Which of the following is not a bone of fore limb?

- (1) Humerus (2) Radius
(3) Tibia (4) Carpal

- "Collar bone" refers to :-

- (1) Sternum
(2) Clavicle
(3) Mandible
(4) Scapula

- Acetabulum is formed by :-

- (a) ilium (b) ischium (c) pubis
(1) a, b (2) a, c
(3) a, b, c (4) b, c

- Which of the following option include the bones whose number is not same in upper and lower limbs?

- (1) Humerus and femur
(2) Metacarpals and metatarsals
(3) Radius and tibia
(4) Carpals and tarsals

LOCOMOTION AND MOVEMENT - I (SKELETAL SYSTEM) # 05
(JOINTS AND DISORDERS)

- Age related disorder characterised by decreased bone mass and increased chances of fractures is
(1) Gout (2) Arthritis
(3) Osteoporosis (4) Both 1 and 2

- Which of the following is **incorrect** match of bone joint?

1	Fibrous joint	Sutures of cranium
2	Ball and socket joint	Between humerus and pelvic girdle
3	Hinge joint	Knee joint
4	Pivot joint	Between Atlas and Axis

- Which of the following joint connects both coxal bones of pelvic girdle ?
(1) Fibrous joint
(2) Cartilagenous joint
(3) Ball and socket joint
(4) Hinge joint
- Which is an example of "pivot Joint" ?
(1) First carpometacarpal joint
(2) Median atlanto-axial joint
(3) Atlanto occipital joint
(4) Joint between Tibia–fibula

- Which of the following joint permits maximum movement ?

- (1) Fibrous joint
(2) Cartilagenous joint
(3) Synovial joint
(4) Gomphosis

- Inflammation of joints due to accumulation of uric acid :-

- (1) Gout (2) Osteoporosis
(3) Arthritis (4) Both 1 and 2

- Which of the following abnormality will include the secretion of abnormal granules pannus ?

- (1) Osteoarthritis
(2) Rheumatoid arthritis
(3) Gout
(4) Osteoporosis

- Select the correct option :-

	Column-A	Column-B
1	between humerus and pectoral girdle	Hinge joint
2	between atlas and axis	Pivot joint
3	between carpals	saddle joint
4	between the carpal and metacarpal of thumb	gliding joint

**LOCOMOTION AND MOVEMENT - II (MUSCLES) # 01
(INTRODUCTION, STRUCTURE OF SKELETAL MUSCLE)**

- Cells of human body exhibit which type of movement :-
(1) Amoeboid
(2) Muscular
(3) Ciliary
(4) All of the above options
- Consider the following four statements (A-D) and select the option which includes all the correct ones only.
(A) Each organised skeletal muscle is made of a number of muscle bundles or fasciculi
(B) Each muscle fibre has many parallelly arranged myofibrils.
(C) Each myofibril contains many serially arranged units called sarcomere.
(D) Each sarcomere has a central "A"-band and two half "I" bands.
Options :-
(1) Statements (B), (C) and (D)
(2) Statements (A) and (B)
(3) Statements (C) and (D)
(4) Statements (A), (B), (C), (D)
- Which of the following structure is **correctly** organised from large to small?
(1) Muscle, Muscle fiber, Myofibril, Sarcomeres, Filaments.
(2) Muscle, muscle fibre, Sarcomere, Filaments Myofibril.
(3) Muscle, Filaments, Myofibrils, Sarcomere, Muscle fibre
(4) Filaments, Sarcomere, Myofibril, Muscle fibre, Muscle.
- In the alimentary canal and reproductive tract which type of muscles are present ?
(1) Striated, involuntary
(2) Striated, voluntary
(3) Unstriated, voluntary
(4) Unstriated, involuntary
- How many points are **correct** about **visceral muscles** :-
(i) Located in the inner walls of hollow visceral organs of the body
(ii) They do not exhibit any striations
(iii) They are primarily involved in locomotary actions and changes of body postures
(iv) Their activities are not under the voluntary control of the nervous system
(v) Contraction slow but for long period
(vi) Their muscle fibre is short, Spindle shape, branched, Uninucleated
(1) Two (2) Three (3) Four (4) Five
- Identify the parts labelled A, B and C in given diagram and select the right option with their correct sequence :-

(1) Myosin, Troponin, Tropomyosin
(2) Tropomyosin, Troponin, F-actin
(3) F-actin, Troponin, Tropomyosin
(4) Troponin, Tropomyosin, F-actin
- "Myosin binding site" is present on :-
(1) Actin protein
(2) Myosin protein
(3) Tropomyosin protein
(4) Troponin protein
- In the rest state, a subunit of Troponin masks:-
(1) Active binding sites for actin on the myosin filaments
(2) Active binding sites for myosin on the myosin filaments
(3) Active binding sites for myosin on the actin filaments
(4) Active binding sites for actin on the actin filaments

LOCOMOTION AND MOVEMENT - II (MUSCLES) # 02
(MUSCLE CONTRACTION AND DISORDERS)

1. The role of calcium in muscle contraction is :-
 - (1) to break the cross-bridges as a cofactor in the hydrolysis of ATP.
 - (2) to bind with troponin, changing its shape so that the active site on actin filament is exposed.
 - (3) to transmit the action potential across the neuromuscular junction.
 - (4) to spread the action potential through the T tubules.
2. Which of the following statements about cross-bridges is false ?
 - (1) They are composed of myosin
 - (2) They bind to ATP after they attach to actin.
 - (3) They contain a ATPase.
 - (4) They split ATP before they attach to actin.
3. Collagenous connective tissue layer holding the muscle bundles together is :-
 - (1) Sacroplasm
 - (2) Pleura
 - (3) Fascia
 - (4) Sarcolemma
4. Thick filaments in muscles are polymerised proteins of :-
 - (1) Meromyosins
 - (2) Actin
 - (3) Troponin
 - (4) Tropomyosin
5. Motor end plate junction is present between :-
 - (1) Neuron and striated muscle
 - (2) Neuron and neuron
 - (3) Muscle and muscle
 - (4) Both (2) and (3)
6. Which of the following statements are **correct**?
 - (i) Muscle contraction is initiated by a signal sent by motor neuron of CNS .
 - (ii) During muscle contraction, isotropic band gets elongated.
 - (iii) The dark band contains only myosin filament.
 - (iv) A motor neuron along with the muscle fibres connected to it constitute a motor unit.
 - (1) (i) and (ii) are correct
 - (2) (ii) and (iii) are correct
 - (3) (iii) and (iv) are correct
 - (4) (i) and (iv) are correct
7. During muscle contraction in human :-
 - (1) Sarcomere does not shorten
 - (2) A-band remain same
 - (3) A, band H zone and I bands shorten
 - (4) Actin filaments length shorten
8. Arrange the following events of muscle contraction in the sequence :
 - (i) Generate an action potential in the sarcolemma
 - (ii) Form a cross bridge
 - (iii) Release a neurotransmitter (Acetylcholine)
 - (iv) Release of calcium ions
 - (v) Pulls the attached actin filaments towards the centre of "A" band
 - (vi) Remove the masking of active sites for myosin

The **correct** option is :-

 - (1) i→ii→iii→iv→v→vi
 - (2) iii→iv→i→ii→vi→v
 - (3) iii→i→iv→ii→v→vi
 - (4) iii→i→iv→vi→ii→v

BREATHING AND EXCHANGE OF GASES # 01

(INTRODUCTION AND RESPIRATORY ORGANS)

1. Match the column I with column II

Column I		Column II	
A	Tracheal tubes	I	Arachnida
B	Gills	II	Frog
C	Moist skin	III	Cockroach
D	Book lungs	IV	Fishes

	A	B	C	D
1	III	IV	II	I
2	III	I	IV	II
3	IV	III	II	I
4	IV	II	I	III

2. Which of the following statement is wrong for respiration ?

- (1) Breathing is a process, in which atmospheric air enters into the body and CO_2 is removed out.
- (2) Gases exchange take place through alveolar surface.
- (3) Transport of gases take place through blood.
- (4) Cells utilise N_2 and release CO_2 for anabolic process.

3. Respiratory organ/structure in flatworm is ?

- (1) Network of tubules
- (2) Vascularised bags
- (3) Simple diffusion over their entire body surface
- (4) Moist skin

4. Respiration involves following steps except ?

- (1) Diffusion across alveolar membrane
- (2) Assimilation
- (3) Diffusion between blood and tissue
- (4) Transport of gases

5. Find out the incorrect match ?

- (1) Insects – Tracheal tubes
- (2) Birds – Lungs
- (3) Frog – General body surface
- (4) Sponges – General body surface

6. Pulmonary respiration is :-

- (1) Respiration through gills
- (2) Respiration through skin
- (3) Respiration through lungs
- (4) Respiration through trachea

7. During hibernation amphibians respire through:-

- (1) moist skin
- (2) lungs
- (3) buccopharyngeal cavity
- (4) gills

8. Spiracles are part of respiratory passage in :-

- (1) Insects
- (2) Frog
- (3) Human
- (4) Sponges

BREATHING AND EXCHANGE OF GASES # 02

(ANATOMY OF HUMAN RESPIRATORY SYSTEM)

1. Which of the following statement is/are incorrect ?
 (a) Flatworms exchange oxygen with carbondioxide by simple diffusion over their entrie body surface.
 (b) Larynx is a bony box which help in sound production.
 (c) Epiglottis is made up of collagen fibrous connective tissue.
 (d) In birds, larynx is a sound producing organ.
 (1) a, b and c (2) a, c and d
 (3) b, c and d (4) a, b and d
2. What is the function of pleural fluid ?
 (1) reduces friction on the lung surface
 (2) protection from external shocks
 (3) provide moisture
 (4) all of the above
3. Which of the following part of respiratory system is not a part of conducting zone ?
 (1) external nostrils to terminal bronchioles
 (2) alveoli and their ducts
 (3) larynx to primary bronchi
 (4) primary bronchi to terminal bronchioles
4. At the level of which thoracic vertebrae does trachea divides into right and left primary bronchi ?
 (1) 5 (2) 6 (3) 9 (4) 4
5. Which of the following structures is present inside the larynx of the respiratory system ?
 (1) Glottis (2) Epiglottis
 (3) Vocal cords (4) Gullet
6. Function of mucus produced by the goblet cells in respiratory tract ?
 (a) moistens the incoming air
 (b) trap the fine dust prticles
 (c) filter out large dust particles
 (d) warms the incoming air
 (1) a and b are correct
 (2) only a is correct
 (3) b and d are correct
 (4) a and c are incorrect
7. Double layered bag like structure covering the lungs is called as :-
 (1) Pericardium
 (2) Peritoneum
 (3) Pleura
 (4) Mysentery
8. Exchange part of the respiratory system comprise of :-
 (1) External nostril upto terminal bronchioles
 (2) Pharynx and larynx
 (3) Pharynx only
 (4) Alveoli and their ducts
9. Which of the following structures/chemical prevent collapse of bronchioles/passage of conduction zone and exchange zone respectively ?
 (1) C-shape hyaline rings; Lecithin
 (2) PSSCCGE; YFCT sheath
 (3) C-Shaped elastin rings; Lecithin
 (4) C-Shaped hyaline rings; YFCT sheath

BREATHING AND EXCHANGE OF GASES # 03

(MECHANISM OF BREATHING)

- Expiration can occur if :-
 - intrapulmonary pressure is higher than the atmospheric pressure.
 - intrapulmonary pressure and atmospheric pressure are equal.
 - intrapulmonary pressure is less than atmospheric pressure.
 - muscles of diaphragm relax.
 - a, d
 - b, c
 - c, d
 - a, b
- Select the correct option for inspiration :-
 - inspiration is a passive process.
 - during this process diaphragm and EICM contracts.
 - intrapulmonary pressure is slightly above the atmospheric pressure.
 - intraalveolar pressure is slightly more than the atmospheric pressure.
- Identify the wrong differences between inspiration and expiration :-

		Inspiration	Expiration
a	EICM	Contract	Relax
b	Size of thoracic cavity	Decreases	Increases
c	Shape of diaphragm	Dome	Flat
d	Movement of air	Atmosphere to lungs	Lungs to atmosphere

- a, b
- b, c
- b, d
- c, d

- True about thoracic cavity/cage is :-
 - An air tight chamber
 - Formed dorsally by sternum
 - Formed laterally by ribs
 - Both (1) and (3)
- By the contraction of EICM, rib and sternum shifts upwards and outwards to increase thoracic volume in :-
 - Anterio-posterior axis
 - Lateral side only
 - No change in thoracic volume
 - Dorso-ventral axis
- Inspiration can occur if the pressure within the lungs is :-
 - more than the atmospheric pressure
 - same as the atmospheric pressure
 - less than the atmospheric pressure
 - higher than the intrapulmonary pressure
- State of painful breathing is :-
 - Eupnoea
 - Dyspnoea
 - Asphyxia
 - Bradypnoea
- In fever breathing rate :-
 - decreases
 - increases
 - no effect
 - 12-16/min

BREATHING AND EXCHANGE OF GASES # 04

(RESPIRATORY VOLUME & CAPACITIES)

1. In which of the following respiratory volume/capacity is correctly matched with its value ?

	Volume/Capacity	Value (in ml)
1	IRV	3500-4500
2	ERV + RV	2100-2300
3	TV	1100-1200
4	TLC	15000

2. When 1200 ml air is left in the lungs, it is called?

- (1) Tidal volume (2) IRV
(3) Vital capacity (4) Residual volume

3. Identify the type of pulmonary volume/capacity on the basis of quantity of air present in the lungs given below.

(I) 1100 ml to 1200 ml

(II) 500 ml

(III) 5000 ml to 6000 ml

Choose the correct option ?

	I	II	III
1	Vital capacity	FRC	Residual volume
2	Residual volume	Tidal volume	TLC
3	Expiratory capacity	Inspiratory capacity	Residual volume
4	Tidal volume	IRV	ERV

4. With reference to human respiration, which is correct ?

- (1) Pulmonary ventilation is equal to alveolar ventilation.
(2) Alveolar ventilation is less than pulmonary ventilation.
(3) Alveolar ventilation is more than pulmonary ventilation.
(4) Pulmonary ventilation is less than alveolar ventilation.

5. Lungs are made up of air filled sacs, the alveoli, They do not collapse even after forceful expiration, because of :-

- (1) IRV (2) TV (3) ERV (4) RV

6. Additional volume of air, a person can inspire by a forcible inspiration is :-

(1) average 1000-1100 ml

(2) IRV

(3) IRV + TV

(4) IRV (avg. 1000-1100 ml)

7. Volume of air present inside lungs after normal inspiration ?

(1) TV

(2) TV + RV

(3) TV + ERV + RV

(4) IRV + TV + ERV + RV

8. After deep inspiration, capacity of maximum expiration of lung is called :-

(1) TV (Tidal volume)

(2) FRC + RV

(3) IRV + TV

(4) VC (Vital capacity)

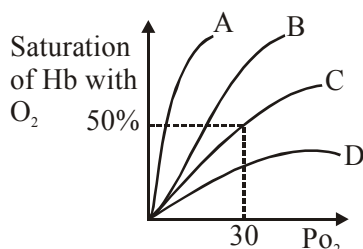
BREATHING AND EXCHANGE OF GASES # 05
 (EXCHANGE OF GASES)

1. What will be the P_{O_2} and P_{CO_2} in the alveolar air compared to those in the atmospheric air ?
 (1) P_{O_2} lesser, P_{CO_2} higher
 (2) P_{O_2} higher, P_{CO_2} lesser
 (3) P_{O_2} higher, P_{CO_2} higher
 (4) P_{O_2} lesser, P_{CO_2} lesser
2. How many layers are present in the diffusion membrane at alveolar level ?
 (1) 5 (2) 3 (3) 2 (4) 4
3. Lecithin is secreted by :-
 (1) Pneumocyte-I (Simple squamous epithelium)
 (2) Pneumocyte-II (Simple squamous epithelium)
 (3) Pneumocyte-I (Simple cuboidal epithelium)
 (4) Pneumocyte-II (Simple cuboidal epithelium)
4. Thickness of respiratory/diffusion membrane is ?
 (1) 1 cm (2) 1 inch
 (3) < 1 mm (4) > 5 mm
5. Partial pressure of O_2 is higher :-
 (1) At tissue level
 (2) At alveolar level
 (3) In oxygenated blood
 (4) In atmosphere
6. Which of the following blood vessel have blood with 95 mm of Hg O_2 ?
 (1) systemic vessels (2) pulmonary vein
 (3) pulmonary vessels (4) systemic vein
7. Partial pressure of oxygen and carbondioxide (in mm of Hg) in deoxygenated blood is ? (Respectively)
 (1) 40; 45 (2) 95; 40
 (3) 95; 45 (4) 104; 40
8. During respiration, exchange of gases occurs:-
 (1) between blood and tissues
 (2) at alveoli level only
 (3) between alveoli and blood
 (4) both (1) and (3)

BREATHING AND EXCHANGE OF GASES # 06

(TRANSPORT OF O_2 & HbO_2 DISSOCIATION CURVE)

- Oxyhemoglobin dissociates into oxygen and hemoglobin at tissue level due to :-
 - (1) low oxygen pressure in tissues
 - (2) high oxygen pressure in tissues
 - (3) equal oxygen pressure inside and outside tissue
 - (4) all times irrespective of oxygen pressure.
- If a large number of people are enclosed in a room then :-
 - (1) oxygen decreases and CO_2 increases
 - (2) oxygen increases and CO_2 decreases
 - (3) oxygen and CO_2 decreases
 - (4) oxygen and CO_2 increases
- Shifting of HbO_2 dissociation curve to right take place in the case of :-
 - (1) Rise in P_{CO_2}
 - (2) Fall in pH
 - (3) Rise in temperature
 - (4) All of the above
- Four statements (A-D) are given. How many statements are correct ?
 - (A) O_2 can bind with Hb in a reversible manner to form HbO_2 .
 - (B) Each Hb molecule can carry a maximum of four molecules of O_2 .
 - (C) Binding of O_2 with Hb is primarily related to P_{O_2} .
 - (D) About 97% of O_2 is transported by RBC in the blood.
 - (1) Two
 - (2) Four
 - (3) Three
 - (4) One
- Pick out the correct statements regarding O_2 -Hb dissociation curve ?
 - (a) Curve 'C' may be normal curve.
 - (b) Curve 'A' may be for myoglobin.
 - (c) Curve 'B' represents saturation of Hb at low P_{O_2} .
 - (d) Curve 'D' represents lower P_{CO_2} .
 - (e) Curve 'B' represents higher P_{CO_2} .
 - (1) a, b, c, d
 - (2) a, b, c
 - (3) a, b, d
 - (4) All are correct
- Every 100 ml of oxygenated blood can deliver around how much ml of O_2 to the tissue under heavy exercise ?
 - (1) 5 ml (approx)
 - (2) 10 ml (approx)
 - (3) 15 ml (approx)
 - (4) 19.4 ml (approx)
- Saturation of Hb with oxygen when partial pressure of oxygen is more than 100 mm of Hg is ?
 - (1) 100% (at tissue level)
 - (2) 97% (at tissue level)
 - (3) 100% (at alveolar level)
 - (4) 97% (at alveolar level)
- Valency of Fe in oxyhaemoglobin is ?
 - (1) Fe^{+3}
 - (2) Fe^{+4}
 - (3) Fe^{+2}
 - (4) can be Fe^{+3} or Fe^{+4}
- Whenever P_{50} value increase, oxygen dissociation curve shift towards.
 - (1) always shift towards right
 - (2) always towards left
 - (3) sometime towards right
 - (4) no effect



BREATHING AND EXCHANGE OF GASES # 07

(CO₂ TRANSPORT)

- | | |
|---|---|
| <p>1. How much amount of CO₂ is transported by plasma ?
 (1) 75% to 78% (2) 5% to 7%
 (3) 20% to 25% (4) 93%</p> <p>2. Nearly how much volume of CO₂ is delivered to alveoli by RBC ?
 (1) 0.3 ml CO₂ (2) 3 ml CO₂
 (3) 0.8–1 ml CO₂ (4) 4 ml CO₂</p> <p>3. Partial pressure of CO₂ in atmosphere is ?
 (1) 40 mm of Hg (2) 45 mm of Hg
 (3) 0.3 mm of Hg (4) 95 mm of Hg</p> <p>4. Minute quantity of enzyme carbonic anhydrase is present in :-
 (1) RBC (2) Plasma
 (3) Both (4) Absent in plasma</p> <p>5. Haldane effect is due to :-
 (1) HCO₃⁻ ion (2) Cl⁻ ion
 (3) CO₂ (4) HbO₂</p> | <p>6. Bohr's effect occurs at :-
 (1) Tissue level
 (2) Alveolar level
 (3) In oxygenated blood
 (4) Where Po₂ is very high</p> <p>7. Bulk of CO₂ released from body tissues into the blood is present as :-
 (1) 70% as carbamino-Hb
 (2) 70% as carboxy-Hb
 (3) 70% as HCO₃⁻ in blood plasma
 (4) 30% as carbamino-Hb in blood plasma</p> <p>8. Another name for chloride shift is ?
 (1) Haldane effect
 (2) Hamburger phenomenon
 (3) Bohr's effect
 (4) Hering-Breuer reflex</p> |
|---|---|

BREATHING AND EXCHANGE OF GASES # 08

(REGULATION OF RESPIRATION & DISORDERS)

1. _____ is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles ?
(1) asthma (2) emphysema
(3) asbestosis (4) fibrosis
2. Chronic disorder in which alveolar walls are damaged ?
(1) asthma
(2) emphysema
(3) pneumonia
(4) occupational respiratory disorders
3. What happens to the respiratory process in a man going up a hill ?
(1) decreases (2) increases
(3) remain same (4) no respiration at all
4. How many of the following statements are correct ?
(a) Human beings have a significant ability to maintain and moderate the respiratory rhythm to suit the demands of the body tissues.
(b) Pneumotaxic centre can moderate the functions of the respiratory rhythm centre.
(c) A chemosensitive area is situated adjacent to the rhythm centre which is highly sensitive to CO_2 and hydrogen ions.
(d) The role of oxygen in the regulation of respiratory rhythm is quite insignificant
(1) only a (2) only b
(3) only a and b (4) all
5. Asthma is caused due to :-
(1) Infection of lungs
(2) Bleeding into pleural cavity
(3) Infection of trachea
(4) Spasm of bronchial muscles
6. Which of the following detect the level of CO_2 and hydrogen ions in blood ?
(1) respiratory rhythm center
(2) only chemosensitive region present near respiratory center.
(3) carotid bodies and aortic bodies
(4) pneumotaxic center
7. Neural signal from which centre can reduce the duration of inspiration ?
(1) DRG (Medulla)
(2) VRG (Upper pons)
(3) Pneumotaxic centre (Pons)
(4) Penumataxic centre (Medulla)
8. Hb combines with carbonmonoxide gas to form:-
(1) Carbaminohaemoglobin
(2) Haemocyanin
(3) Carboxyhaemoglobin
(4) Both (2) and (3)
9. Respiratory muscles and respiratory centre required for normal expiration is ?
(1) EICM and diaphragm ; VRG
(2) IICM and abdominal muscles ; VRG
(3) EICM and diaphragm ; DRG
(4) Normal expiration is a passive process, no muscles and respiratory centre required
10. Role of which of the following gas or chemical is insignificant in regulation of respiration ?
(1) CO_2
(2) O_2 and $[\text{H}^+]$
(3) CO_2 and $[\text{H}^+]$
(4) O_2

BODY FLUIDS AND CIRCULATION # 01

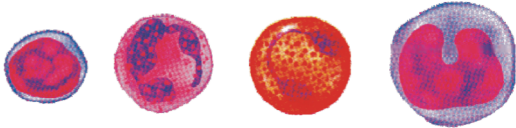
(PLASMA AND RBC)

- Largest RBC found in ?
 (1) Frog (2) Amphiuma
 (3) Elephant (4) Rabbit
- HbF and HbA generally consist of ?
 (1) $2\alpha + 2\gamma$, $2\alpha + 2\delta$ (2) $2\alpha + 2\beta$, $2\alpha + 2\gamma$
 (3) $2\beta + 2\alpha$, $2\alpha + 2\delta$ (4) $2\alpha + 2\gamma$, $2\alpha + 2\beta$
- Most abundant protein of blood plasma is :-
 (1) Prothrombin (2) Albumin
 (3) Fibrinogen (4) Globulin
- Which of the following option is not correct for erythrocytes ?
 (1) Membrane is selectively permeable for Na^+ and K^+
 (2) Anaerobic respiration
 (3) Erythropoiesis is stimulated by a hormone of kidney
 (4) Normal count is 5 million/ mm^3 of blood
- Which one is incorrect regarding the composition of blood plasma ?
 (A) Albumin = 4%
 (B) Organic compounds = 10%
 (C) H_2O = 90%
 (D) Inorganic compounds = 0.9%
 (E) Globulin = 5%
 (F) Prothrombin = 0.3%
 (1) A, E (2) E, F (3) B, E (4) B, D
- Composition of plasma in blood is :-
 (1) 55% (2) 65%
 (3) 45% (4) 90%
- Find the correct relation :-
 (1) Blood = Plasma – Corpuscles
 (2) Blood = Plasma + Blood corpuscles
 (3) Plasma + Fibrinogen and large protein = serum
 (4) PCV = RBC – (WBC + Platelets)
- When there is a sudden loss of blood from the body, the organ which supplies blood is ?
 (1) Heart (2) Lung
 (3) Spleen (4) Liver
- Plasma protein primarily involved in defense mechanisms of the body ?
 (1) albumins (2) globulins
 (3) fibrinogen (4) prothrombin

BODY FLUIDS AND CIRCULATION # 02

(WBC AND PLATELETS)

- Which one is correct match :-
(A) Neutrophils – 2-3 lobed nucleus
(B) Monocyte – Phagocytosis
(C) Basophils – Eosinophilia during allergy
(D) Erythrocyte – 20 gm Hb
(E) Platelets – Repairing of mesothelium
(F) Acidophils – 2-3% DLC
(1) B, E (2) A, E (3) B, F (4) A, F
- Total leukocyte count and platelet count respectively in a normal human in per mm^3 of blood is :-
(1) 7000, 45 lakh (2) 8000, 1 lakh
(3) 7000, 2.5 lakh (4) 20,000, 3.5 lakh



Which statement is correct regarding the cells A, B, C, D shown above ?

- (1) D → Number increase during allergy
(2) B → Maximum in total leucocyte count
(3) A → Phagocytosis of bacteria and secrete heparin
(4) C → Secretion of heparin
- Most abundant nucleated cells in human blood are :-
(1) RBC (2) Neutrophils
(3) Platelets (4) Lymphocytes

- Normal blood platelet count is :-
(1) 1,50,000 – 3,50,000/ cm^3
(2) 6,000 – 8,000/ mm^3
(3) 1,50,00 – 3,50,00/ cm^3
(4) 1,50,000 – 3,50,000/ mm^3
- Most abundant phagocytic cell of blood is :-
(1) Lymphocyte (2) Neutrophil
(3) Acidophil (4) Basophil
- Which statement is not correct for leucocyte ?
(1) Total leucocyte count in an adult person is 6000-8000/ mm^3 of blood.
(2) Increase in TLC is called leucocytopenia
(3) Acidophil has bilobed shape of nucleus
(4) 'S'-shape nucleus is present in basophil
- Match column-I with column-II and select the correct option from below :-

Column I		Column II	
(a)	Eosinophil	(i)	Coagulation
(b)	RBC	(ii)	Universal recipient
(c)	AB group	(iii)	Resist infection
(d)	Platelet	(iv)	Contraction of heart
(e)	Systole	(v)	Gas transport

- (1) b-v, d-iii, e-iv (2) c-ii, d-i, e-iv
(3) a-iii, b-v, c-i (4) a-v, c-i, e-iv

BODY FLUIDS AND CIRCULATION # 03

(BLOOD CLOTTING AND BLOOD GROUPS)

- [illegible]

a		b
(1)	Thrombin	Fibrinolysis
(2)	Thrombin	Fibrin
(3)	Thrombokinas	Thrombin
(4)	Fibrin	Thrombin

BODY FLUIDS AND CIRCULATION # 04

(TYPES OF BLOOD CIRCULATION)

1. Among the following options which represents correct blood flow pathway in pulmonary circulation is ?

- (1) Right ventricle $\xrightarrow{\text{Pulmonary artery}}$ Lung
 $\xrightarrow{\text{Pulmonary vein}}$ Right atrium
- (2) Left ventricle $\xrightarrow{\text{Aorta}}$ Body $\xrightarrow{\text{Vena Cava}}$ Right atrium
- (3) Right ventricle $\xrightarrow{\text{Pulmonary vein}}$ Lung
 $\xrightarrow{\text{Pulmonary artery}}$ Left atrium
- (4) Right ventricle $\xrightarrow{\text{Pulmonary artery}}$ Lung
 $\xrightarrow{\text{Pulmonary vein}}$ Left atrium

2. Which one of the following options is correctly matched with its category ?

	Group	Type of circulation	Blood is oxygenated by
(1)	Fish	Single circulation	Skin
(2)	Amphibia	Double circulation	Gills
(3)	Reptiles	Incomplete double circulation	Lungs
(4)	Aves	Incomplete double circulation	Lungs

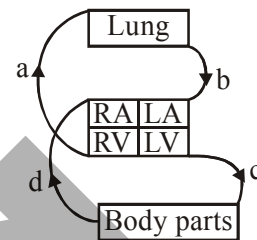
3. Pulmonary circulation is present between ?
- (1) Right ventricle to left ventricle
 (2) Left ventricle to right atrium
 (3) Right ventricle to left atrium
 (4) Right ventricle to right atrium

4. How many of the following animals have double circulation.

Rabbit, Rat, Frog, Dolphin, Lizard, Whale, Peacock, Pigeon, Fish (Catla), Butterfly.

(1) Five (2) Eight (3) Seven (4) Six

5. In the given diagram identify the systemic vein and pulmonary artery ?



- (1) 'a' is pulmonary artery, 'b' is systemic vein
 (2) 'a' is pulmonary artery, 'c' is systemic vein
 (3) 'a' is pulmonary artery, 'd' is systemic vein
 (4) 'c' is pulmonary artery, 'a' is systemic vein

6. Open type circulatory system is found in ?

(1) Toad (2) Prawn
 (3) Lizard (4) Pigeon

7. If a person have two chambers (one atrium and one ventricle) with the vena cava entering the atrium and the aorta leaving the ventricle then which of the following statement would be correct ?

(1) no oxygen would reach the cells
 (2) no blood would reach the head and neck
 (3) the blood would be unable to carry food to the cells
 (4) there would be no blood circulation

8. Animals with double circulation are :-

(1) Fishes, crocodile, birds
 (2) Mammals and birds only
 (3) Reptiles, birds, mammals
 (4) Crocodiles, birds, mammals

BODY FLUIDS AND CIRCULATION # 05

(STRUCTURE OF HEART)

1. If due to some injury chordae tendental of the bicuspid valve of the human heart is partially non-functional, what will be the immediate effect ?
 - (1) Flow of blood into the pulmonary artery will be reduced.
 - (2) The flow of blood into the systemic vein will be slowed down.
 - (3) Pacemaker will stop working.
 - (4) Blood will tend to flow back into the left atrium.
2. Which of the following is mismatch regarding human heart ?
 - (1) Pacemaker – SA node
 - (2) Four chambered with right systemic arch
 - (3) Aortic semilunar valve – systemic aorta
 - (4) Tricuspid valve – between right atrium and right ventricle
3. Heart covering is called :-
 - (1) Peritoneum
 - (2) Pleura
 - (3) Pericardium
 - (4) Perichondrium
4. In embryonic heart IVC opening in right atria is guarded by :-
 - (1) Eustachian valve
 - (2) Semilunar valve
 - (3) Mitral valve
 - (4) Epiglottis
5. Which of the following heart valves have three flaps or cusps ?
 - (1) Bicuspid and tricuspid valves
 - (2) Tricuspid and semilunar valves
 - (3) Tricuspid valve only
 - (4) Bicuspid and semilunar valves
6. How many pulmonary veins in human open into left atrium ?
 - (1) One
 - (2) Two
 - (3) Three
 - (4) Four
7. Epicardium of heart is made of which type of epithelium ?
 - (1) Simple squamous
 - (2) Simple cuboidal
 - (3) Only connective tissue
 - (4) Cardiac muscle

BODY FLUIDS AND CIRCULATION # 06

(CONDUCTING SYSTEM OF HEARTS)

1. The action potential reaches the AV node from the SA node, there is delay of the action potential. This delay is important because :-
 - (1) It allows atria to rest
 - (2) It allows a stronger right atrial contraction
 - (3) It allows ventricles to receive all the blood from the atria.
 - (4) It allows right atria to receive the blood from vena cava.
2. All the components of the conduction system can generate an action potential for the contraction of heart muscle, but the SA node act as pacemaker because :-
 - (1) all the components of the heart cannot conduct the action potential.
 - (2) only SA node is auto excitable and autorhythmic.
 - (3) the SA node has a higher inherent rate of depolarisation.
 - (4) the SA node has a lower inherent rate of depolarisation.
3. Which term does not apply to human heart ?
 - (1) Four chambered
 - (2) Pace maker
 - (3) Mitral valve
 - (4) Neurogenic
4. Patch of nodal tissue present in right upper corner of right atrium called :-
 - (1) SAN
 - (2) AVN
 - (3) Bundle of His
 - (4) Purkinje fibres
5. Nodal tissue is :-
 - (1) Specialised neural tissue
 - (2) Specialised cardiac musculature
 - (3) Neural tissue have muscle like properties
 - (4) Cannot regulated by ANS
6. Which of the following nodal musculature has ability to generate action potentials without any external stimuli ?
 - (1) SAN
 - (2) AVN
 - (3) AV-Bundle
 - (4) All of the above
7. Heart rate is higher in women, why ?
 - (1) Because of monthly blood loss
 - (2) Smaller size of heart
 - (3) AV-Node act as pacemaker
 - (4) Hormonal effect
8. 'Shock/loss of blood' leads to :-
 - (1) Tachycardia
 - (2) Bradycardia
 - (3) No effect on heart rate
 - (4) Rise in B.P.

BODY FLUIDS AND CIRCULATION # 07

(CARDIAC CYCLE AND HEART SOUNDS)

1. Which point is incorrect regarding first heart sound ?
 - (1) It is produced at the begining of ventricular systole.
 - (2) Associated with closure of tricuspid and bicuspid valves
 - (3) It is called 'LUBB'
 - (4) High pitch sound for short period
2. In human normally the stroke volume of heart is :-
 - (1) 5000 ml (2) 120 ml
 - (3) 70 ml (4) 200 ml
3. Which of the following statement is incorrect?
 - (1) during a cardiac cycle, each ventricle pumps out approximately 70 ml of blood.
 - (2) Stroke volume multiplied by the heart rate (Number of beats per minute) gives the cardiac output.
 - (3) Body has ability to alter the stroke volume as well as the heart rate.
 - (4) Cardiac output of an athlete will be lesser than that of an ordinary man.
4. Which of the following events take place in cardiac cycle after the end of first heart sound and before the on set of second heart sound ?
 - (1) atrial systole and ventricular systole
 - (2) atrial systole and ventricular diastole
 - (3) atrial diastole and ventricular systole
 - (4) Joint diastole
5. Given below are four statements regarding human blood vascular system ?
 - (a) there is no role of calcium ions in blood clotting.
 - (b) cardiac output is the amount of blood pumped by each ventricle in one second.
 - (c) arteries are thin walled and have narrow human as compared to veins.
 - (d) the stage of cardiac cycle where all the four chambers are in relaxed stage is called joint diastole.

How many of the above statements are correct?

(1) One (2) Two (3) Three (4) Four
6. First heart sound is associated with the closure of _____ valves whereas second heart sound is associated with the closure of _____ valves.
 - (1) semilunar, atrioventricular
 - (2) atrio ventricular, semilunar
 - (3) bicuspid, tricuspid
 - (4) tricuspid, bicuspid
7. Cardiac output is defined as :-
 - (1) amount of blood pumped out by each ventricle in one minute.
 - (2) amount of blood pumped out by each atrium in one minute.
 - (3) amount of blood pumped out by each ventricle in one second.
 - (4) amount of blood pumped out by each ventricle in one hour.
8. Semilunar valves remain open in which phase of cardiac cycle ?
 - (1) joint diastole
 - (2) atrial systole
 - (3) ventricular systole
 - (4) ventricular diastole

BODY FLUIDS AND CIRCULATION # 08

(BLOOD PRESSURE & DISORDER)

1. Which of the following statements are incorrect?
 - (A) The electrical activity of heart can be recorded from inside the body by using electrocardiograph.
 - (B) Angina is also called 'angia pectoris' a symptom of acute chest pain when not enough oxygen reaches the skeletal muscle of heart.
 - (C) Coronary artery disease referred as heart murmur.
 - (D) Heart failure is known as the cardiac arrest.
 - (1) A, B and C (2) B, C and D
 - (3) B and C (4) A, B C and D
2. Which of the following is correct about 'ECG':-
 - (1) ECG is a graphical representation of electrochemical activity of brain.
 - (2) For the detailed evaluation of heart's function, multiple leads are attached to abdominal region.
 - (3) By counting the number of QRS complexes that occur in a given time period we can find out heart rate.
 - (4) ECG obtained from different individuals have different shape for a given lead configuration.
3. Pumping and resting pressure is related with :-
 - (1) Diastolic and systolic pressure
 - (2) Systolic and diastolic pressure
 - (3) Partial pressure of O_2 and CO_2
 - (4) Both (2) and (3)
4. When heart beat decreases, the condition is called :-
 - (1) Bradycardia (2) Tachycardia
 - (3) Cardiac arrest (4) Leucopenia
5. When heart muscle is suddenly damaged by an inadequate blood supply. This condition is called :-
 - (1) Angina pectoris (2) Heart failure
 - (3) Heart attack (4) Heart arrest
6. Congestion of the lungs is one of the main symptom of which disease of heart ?
 - (1) Heart failure (2) Angina
 - (3) Heart attack (4) Cardiac arrest
7. High blood pressure can cause :-
 - (1) Blindness (2) Renal failure
 - (3) Stroke (CVA) (4) All
8. If AV-node gets damaged, the condition leads to :-
 - (1) Heart failure (2) Heart block
 - (3) Varicose (4) Cardiac arrest

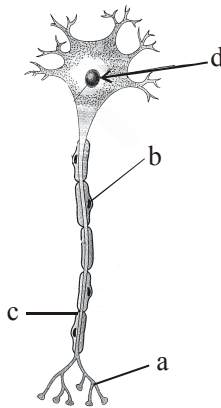
BODY FLUIDS AND CIRCULATION # 09

(BLOOD VESSELS, PORTAL SYSTEM, LYMPH)

1. Read the following statements (A-D) :-
 (A) Arteries always carry blood away from heart.
 (B) Valves are absent in the arteries.
 (C) Artery always carry deoxygenated blood.
 (D) Lumen of artery is wide.
 How many statements are wrong ?
 (1) Three (2) Four (3) One (4) Two
2. Which statement is correct about lymph (Tissue fluid) ?
 (1) It does not have the same mineral distribution as that of blood plasma.
 (2) An elaborate network of vessels called the lymphatic system collects this fluid and drain it back into number of minor veins.
 (3) Fats are reabsorbed through plasma in lacteals present in stomach villi.
 (4) Lymph is colourless fluid containing specialised lymphocytes which are responsible for the immune responses of the body.
3. Blood will loose maximum oxygen when it will pass through ?
 (1) alveolar capillaries (2) left atrium
 (3) arteries (4) tissue capillaries
4. As compared to artery, a vein has :-
 (1) thinner walls (2) larger lumen
 (3) less musculature (4) all of the above
5. Lymphatic system drains fluid back to the :-
 (1) Major arteries
 (2) Capillaries
 (3) Major lymphatic ducts
 (4) Major veins
6. Unique vascular connection that exists between digestive tract and liver is called is :-
 (1) Portal triad
 (2) Hepatic lobule
 (3) Lymphatic system
 (4) Hepatic portal system
7. Tissue fluid (lymph) has :-
 (1) same protein content as that in plasma.
 (2) same formed element composition as that in plasma.
 (3) same mineral distribution as that in plasma.
 (4) same large water soluble substances composition as plasma.
8. Blood vascular system consists of all except:-
 (1) Muscular chambered heart
 (2) Network of open branching blood vessels
 (3) Blood (the fluid)
 (4) All of the above are included in blood vascular system

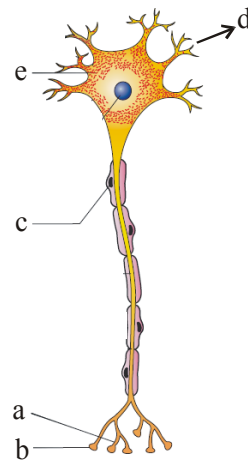
NEURAL CONTROL AND COORDINATION # 01 (NERVOUS SYSTEM)

1. Given below is a diagram of neuron, labelled by a,b,c and d points. Choose the correct match for these points :



(1)	a = Dendrites	Efferent fibre
(2)	b = Schwann cell	Myelination in CNS
(3)	c = Node of Ranvier	Saltatory conduction
(4)	d = Nissl granules	Internal conduction of impulse

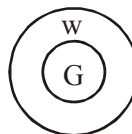
2. Neural system composed of specialised cells called neuron, which has property of :-
 (1) Excitability and flexibility
 (2) Conductivity and elasticity
 (3) Excitability and conductivity
 (4) Flexibility and contractibility
3. In the axon of motor nerve fibres, the nerve impulse travels ?
 (1) Voluntary muscles to brain
 (2) Organ to CNS
 (3) CNS to organ
 (4) Cell body to dendron
4. Recognise the given figure and find the correct labelling?
 (i) Schwann cell
 (ii) Synaptic knob
 (iii) dendrites
 (iv) Axon terminal
 (v) Nissl's granule
 (vi) Node of Ranvier



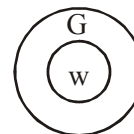
- (1) a-iv, b-ii, c-i, d-iii, e-v
 (2) a-ii, b-iv, c-iii, d-i, e-v
 (3) a-ii, b-iv, c-vi, d-i, e-v
 (4) a-iv, b-ii, c-iii, d-vi, e-v
5. Find out correct statement :-
 (A) Somatic neural system relay impulses from CNS to skeletal muscles.
 (B) ANS transmits impulses from CNS to voluntary muscles.
 (C) Neural organisation is very simple in vertebrates where better organised in insects.
 (D) Neuron can detect, receive and transmit stimuli.
 (1) A and B correct (2) B and C correct
 (3) C and D correct (4) A and D correct
6. Which of the following statements is **true** ?
 (1) Saltatory conduction is seen in non-myelinated nerve fibres.
 (2) Nissl's granules synthesize protein.
 (3) Neurofibril inhibits internal conduction of nerve impulse.
 (4) Trigger zone, triggers nerve impulse at base of dendron.
7. Scavenger cells of nervous tissue are-
 (1) Oligodendrocytes
 (2) Astrocytes
 (3) Cell body
 (4) Microglial cells

8. Opaque white appearance of white matter is due to:-
- (1) Fibers of tract covered by axolemma only.
 - (2) Fibers of tract not covered by myelin sheath
 - (3) Fibers of tract covered by myelin sheath.
 - (4) White matter absent in CNS.

9. Find out correct match for these (A) & (B) histological section of brain :-



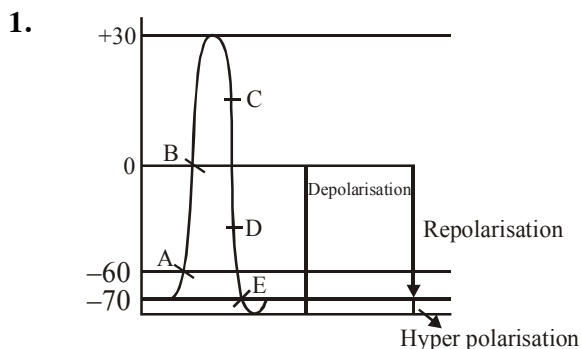
(A)



(B)

- | | |
|--------------------|-----------------|
| (1) A - Cerebellum | B - Cerebrum |
| (2) A - Medulla | B - Cerebrum |
| (3) A - Pons | B - Spinal cord |
| (4) A - Cerebrum | B - Medulla |

NEURAL CONTROL AND COORDINATION # 02
(NERVE IMPULSE AND CONDUCTION)



Give the answer of following question based on above diagram :

Which of statement is correct :-

- (1) At point A, K^+ VGC are closed and passive diffusion of Na^+ occur from ICF to ECF
- (2) At point B, Na^+ VGC are open and active transport of K^+ occur from ECF to ICF
- (3) At point C, K^+ VGC are close and active transport of Na^+ occur from ICF to ECF
- (4) At point D, Na^+ VGC are closed and passive transport of Na^+ occur from ECF to ICF

2. Read the following statements carefully :-

- (A) Unipolar neurons has cell body with one axon only and are found in retina of eye.
- (B) Unmyelinated nerve fibres don't have myelin sheath because they are never enclosed by schwann cells in PNS.
- (C) The new potential developed on post-synaptic membrane after binding of neurotransmitter with receptors, is always excitatory
- (D) $Na^+ - K^+$ pump is responsible for resting stage
- (E) Na^+ concentration is more in axoplasm.

Which of the above statements are **not correct**?

- (1) A and B
- (2) A, B and C
- (3) B, C and D
- (4) A, B, C and E

3. Which of the following statements is **false** about the electrical synapse ?

- I. At electrical synapses, the membranes of pre and post synaptic neurons are in very close proximity.
- II. Electrical current can flow directly from one neuron into the other across the synapses.
- III. Transmission of an impulse across electrical synapses is very similar to impulse conduction along single axon.
- IV. Electrical synapses pass electrical signal between cells with the use of Ach
- V. Electrical synapses are fast.
- VI. Electrical synapses are rare in our system.

- (1) I and II
- (2) Only II
- (3) Only IV
- (4) Only V

4. When a neuron is in resting stage axonal membrane is more permeable for ___(i)___, nearly impermeable for ___(ii)___ and impermeable for ___(iii)___:-

- (1) Na^+ , K^+ , negatively charged protein molecules
- (2) K^+ , Na^+ , negatively charged protein molecules
- (3) K^+ , negatively charged protein molecules, Na^+
- (4) Na^+ , negatively charged protein molecules, K^+

5. After depolarization the rise in permeability to K^+ leads to K^+ diffusion outside the membrane. The above statement represents which stage of impulse conduction?-

- (1) Polarisation
- (2) Depolarisation
- (3) Repolarisation
- (4) Hyperpolarisation

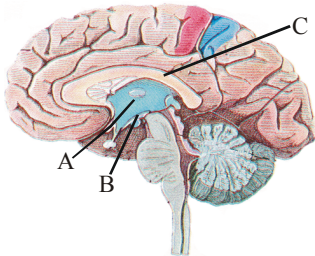
6. When a stimulus is applied at a site on the polarised membrane. Then :-

- (1) membrane becomes freely permeable to Na^+ .
- (2) membrane becomes more permeable to K^+ .
- (3) ionic gradient across the membrane are maintained by $Na^+ - K^+$ -pump.
- (4) membrane becomes nearly impermeable to Na^+

7. How many factors influences the velocity of action potential propagation?
 (a) Temperature (b) Myelin sheath
 (c) Diameter of axon (d) Pressure
 (e) Length of axon
 (1) four (2) three
 (3) two (4) one
8. Transmission of neuronal signal across the synapse required the release of in most of the synapses of body.
 (1) Na^+ ions (2) K^+ ions
 (3) Cl^- ions (4) Neurotransmitter
9. Which ion is responsible for reversal of polarity during conduction ?
 (1) K^+ (2) Na^+
 (3) K^+ & Na^+ (4) Ca^{+2}
10. Some neurotransmitter excite the post synaptic neuron where others inhibit postsynaptic neuron. It depends on :-
 (1) The permeability changes are induced in postsynaptic neuron by binding of neurotransmitter
 (2) Closing of specific ion channels in the post synaptic membrane by binding of Neurotransmitter
 (3) It depends on electrical transmission of synapse by K^+
 (4) This is not applicable for chemical synapse
11. Velocity of nerve impulse is more in :-
 (1) Unmyelinated axons
 (2) Continuous myelinated axon
 (3) Discontinuous myelinated axons
 (4) In dendron and cyton

NEURAL CONTROL AND COORDINATION # 03 (HUMAN BRAIN)

1. Given below is diagrammatic sketch of a sagittal section of the human brain. Identify A, B and C with their **correct** function

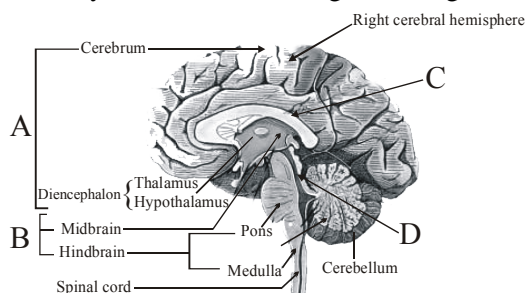


	A	B	C
(1)	Thalamus (Coordinating centre for Sensory and Motor Neuron)	Corpus callosum (Connects cerebral hemispheres)	Hypothalamus (Body temperature)
(2)	Hypothalamus (Coordinating centre for Sensory and Motor Neuron)	Corpus callosum (Connects cerebral hemispheres)	Thalamus (Body temperature)
(3)	Thalamus (Coordinating centre for Sensory and Motor Neuron)	Hypothalamus (Body temperature)	Corpus callosum (Connects cerebral hemispheres)
(4)	Corpus callosum (Connects cerebral hemispheres)	Hypothalamus (Body temperature)	Thalamus (Coordinating centre for Sensory and Motor Neuron)

2. Pneumotaxic centre is present in :

- (1) Fore brain (2) Mid brain
(3) Spinal cord (4) Hind brain

3. Identify A, B, C and D in given diagram -



- (1) A - Forebrain, B - Brainstem, C - Corpus callosum, D - Cerebral aqueduct

- (2) A - Forebrain, B - Brainstem, C - Cerebral aqueduct, D - Corpus callosum
(3) A - Brainstem, B - Forebrain, C - Corpus callosum, D - Cerebral aqueduct
(4) A - Brainstem, B - Forebrain, C - Cerebral aqueduct, D - Corpus luteum

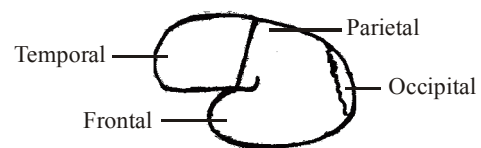
4. Read the following statements and choose the **correct** option -

- I. Cerebellum has convoluted surface in order to provide the additional space for more neurons.
II. The medulla is connected to the spinal cord
III. Medulla contains controlling centres for respiration, cardiovascular reflexes and gastric secretion.

- (1) All are correct
(2) Only I is correct
(3) Only I and III are correct
(4) Only II is correct.

5. Due to presence of which structure cerebral cortex is related to storage of memory. Communication of information towards different parts and also integrates two sensory stimuli :-

- (1) Sensory area (2) Motor area
(3) Association area (4) All of the above
6. Identify the incorrectly labelled lobe in the cerebral hemisphere:-

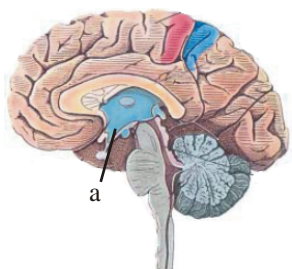


- (1) Temporal and parietal
(2) Temporal and occipital
(3) Temporal and frontal
(4) Frontal and parietal

7. Association area are :-

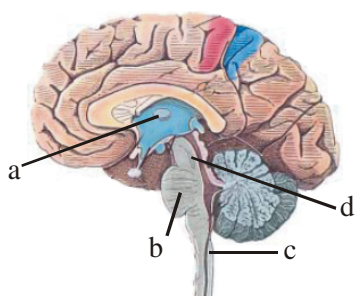
- (1) Sensory area found in deep part of cerebral cortex.
(2) Motor area found in surface layer of grey matter of cerebrum.
(3) Neither clearly sensory nor motor found in grey matter of cerebrum.
(4) Hypothalamic neurons which secrete hormones.

8. Which one is not related with 'a' ?



- (1) Regulation of sexual behaviour
- (2) Neuro secretory cells
- (3) Intersensory associations and balance
- (4) Regulation of body temperature

9. Site of sensory and motor signaling is :-



- (1) d
- (2) c
- (3) b
- (4) a

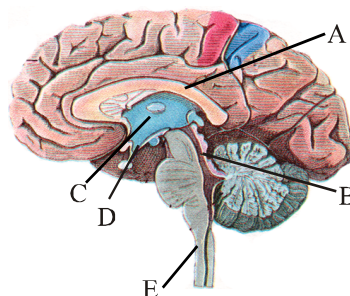
10. Which of the following is not a characteristic feature of mammalian brain ?

- (1) Corpus callosum
- (2) Hollow corpora quadrigemina
- (3) Arachnoid
- (4) Mammillary body

11. Which option is correct regarding corpora quadrigemina?

- (1) It is composed of four hollow lobes
- (2) It is characteristic of amphibians
- (3) It is located dorsally in midbrain
- (4) It is not the part of brain stem

12. Given below is a sagittal section of human brain, identify the structure labelled as A,B,C,D and E with their important function :-



(A)	Corpus callosum	Communication between two cerebellar hemisphere
(B)	Cerebral aqueduct	Connects III ventricle with IV ventricle
(C)	Pons	regulation of emotional behaviour
(D)	Hypothalamus	control body temperature, urge for eating and drinking
(E)	Medulla oblongata	controls cardiovascular reflexes

Options :-

- (1) Only A is correct
- (2) A & D are correct
- (3) C & D and E are correct
- (4) Only B, D & E are correct

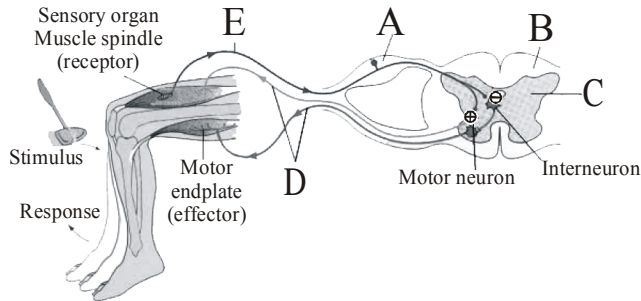
NEURAL CONTROL AND COORDINATION # 04 (SPINAL CORD AND PNS)

1. Which of the following nerve transmit nerve impulse towards CNS only ?
(1) Oculomotor nerve
(2) Abducence nerve
(3) Ventral root of spinal nerve
(4) Auditory nerve
2. Movement of tongue is controlled by which nerve :
(1) 12th (2) 7th (3) 5th (4) 9th
3. Dorsal root of spinal nerve contains :-
(1) Sensory neurons (2) Motor neuron
(3) Both (1) and (2) (4) Non of above
4. 'H' shape grey matter found in :-
(1) Spinal cord (2) Cerebrum
(3) Cerebellum (4) Medulla
5. The cranial nerve associated with sense of body balance is :-
(1) IX (2) VIII (3) VII (4) VI
6. Visceral organs are controlled by :-
(1) Somatic nervous system, involuntary
(2) Somatic nervous system, voluntary
(3) PNS, involuntary
(4) ANS, involuntary
7. Sympathetic nervous system increases :-
(1) Heart beat rate
(2) Secretion of saliva
(3) Secretion of digestive juices
(4) All of above
8. Cranial nerve called dentist's nerve is :-
(1) Optic (2) Auditory
(3) Trigeminal (4) Oculomotor

Tg: @Chalnaayaaar

NEURAL CONTROL AND COORDINATION # 05 (REFLEX ACTION)

1. The following diagrammatic representation of reflex action shows knee jerk reflex.



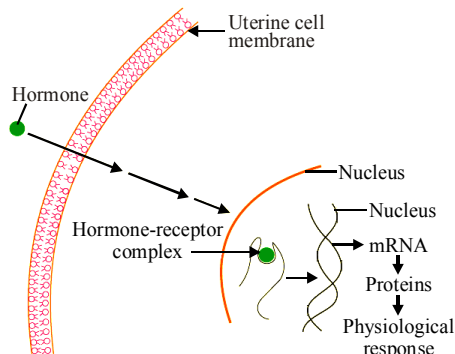
In which of the following options corrects words for all the 5 blanks (A to E) are indicated?

	A	B	C	D	E
(1)	Dorsal root ganglion	White matter	Gray matter	Afferent pathway	Efferent pathway
(2)	Dorsal root ganglion	White matter	Gray matter	Efferent pathway	Afferent pathway
(3)	Dorsal root ganglion	Gray matter	White matter	Efferent pathway	Afferent pathway
(4)	Ventral root ganglion	White matter	Gray matter	Efferent pathway	Afferent pathway

2. Which one does not involve brain ?
- Spinal reflex
 - Cranial reflex
 - (1) and (2) both
 - None of above
3. In knee jerk reflex effector is :-
- Muscle spindle
 - Sensory neuron
 - Motor neuron
 - Motor end plate
4. Reflex action – knee jerk reflex is controlled by :-
- Brain
 - Cerebrum
 - Cerebellum
 - Spinal cord

ENDOCRINE SYSTEM # 01 (MECHANISM OF HORMONE ACTION)

1. Following is a diagrammatic representation of the mechanism of hormone action.



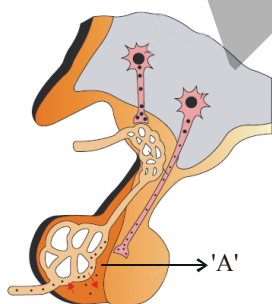
Which of the following statement does **not** support the hormone action depicted.

- (1) It explains the action of a hormone which interacts with membrane bound receptors.
 - (2) It explains the action of a hormone which interacts with intracellular receptors in nucleus.
 - (3) The hormone regulates chromosome function by the interaction of hormone receptor complex with genome.
 - (4) This hormone does not generate a second messenger
2. Secondary messengers :-
- (1) Are substance that interact with first messengers inside cells
 - (2) Are substances that bind to first messengers in the cell membrane
 - (3) Are hormone secreted by cell in response to stimulation by another hormone
 - (4) Mediate the intracellular response to many different hormones and neurotransmitters
3. Hormones are :-
- (1) Non-nutritive, non-antigenic & non species specific
 - (2) Nutritive, non antigenic & non species specific
 - (3) Non-nutritive, non-antigenic & species specific
 - (4) Non-nutritive, antigenic & non species specific
4. Which of the following is correct about endocrine glands ?
- (a) These are ductless glands
 - (b) Their secretions are called hormones
 - (c) Endocrine glands release hormones into the blood and transported to a distantly located target organ
 - (d) Invertebrates possess very simple endocrine systems with many hormones
- (1) a, b, c (2) b, c, d
(3) c, d (4) a, b, c, d
5. Intracellular receptors are mostly :-
- (1) Membrane receptor
 - (2) ER receptor
 - (3) Nuclear receptor
 - (4) On plasma membrane
6. Which of the following is not a second messenger in hormone action ?
- (1) Calcium (2) Sodium
 - (3) cAMP (4) cGMP
7. Thyroxine receptor are :-
- (1) Membrane bound receptor
 - (2) Intracellular receptor
 - (3) Nuclear receptor
 - (4) Both (2) and (3)
8. Maximum protein hormones receptors are :-
- (1) Membrane bound receptors
 - (2) Nuclear receptor
 - (3) Intracellular receptors
 - (4) Both (2) and (3)

ENDOCRINE SYSTEM # 02(PITUITARY AND HYPOTHALAMUS)

- In a female labour pain is of low intensity during parturition, then what step should be taken by doctor ?
 (1) Prolactin will given
 (2) Oxytocin injection will given
 (3) Progesterone will given
 (4) ADH will given
- Releasing hormones and inhibiting hormones are produced by :-
 (1) Hypothalamus
 (2) Pituitary gland
 (3) Upper lateral part of diencephalon
 (4) Thyroid gland
- Which of the following is correct about human?
 (a) Pars distalis produces GH, PRL, TSH, ACTH, LH, FSH
 (b) Pars intermedia secretes only one hormone called melatonin
 (c) Posterior lobe of pituitary is also called as pars nervosa
 (d) Posterior pituitary stores and releases two hormones called oxytocin and vasopressin
 (1) a, b and c (2) b, c and d
 (3) a, c and d (4) a, b, c and d

4.



Which of the following diseases are related to the deficiency of hormones secreted from the structure marked 'A' in the above given figure:-

- (A) Diabetes insipidus (B) Dwarfism
 (C) Acromegaly (D) Gigantism
 (E) Grave disease
 (1) A,B,C,D and E (2) C,D and E
 (3) B only (4) 'C' only

- Which of the following is not a correct match of hormone and function :-
 (1) LH $\Rightarrow$ Production of testosterone by the testes
 (2) Prolactin $\Rightarrow$ milk production in the mammary glands
 (3) FSH $\Rightarrow$ Development of Graafian follicle
 (4) Oxytocin $\Rightarrow$ Relax the uterine muscles
- Oxytocin and vasopressin, which are actually synthesized by the A and are transported B to C.
 Choose A, B, C from the given options :-

	A	B	C
(1)	Hypothalamus	by blood	Neurohypophysis
(2)	Hypothalamus	axonally	Adenohypophysis
(3)	Hypothalamus	by blood	Adenohypophysis
(4)	Hypothalamus	axonally	Neurohypophysis

- Hypothalamus contains several group of neurosecretory cells called :-
 (1) Parietal cells (2) Oxyntic cells
 (3) Nuclei (4) G-cells
- Pars intermedia is the part of :-
 (1) Neurohypophysis
 (2) Adenohypophysis
 (3) Posterior lobe of pituitary
 (4) Hypothalamus

ENDOCRINE SYSTEM # 03 (THYROID, PARATHYROID AND ADRENAL GLAND)

- Which of the following is **correct** ?
 (a) Hypercalcemic hormone is thyrocalcitonin (TCT) hormone
 (b) Parathyroid hormone (PTH) increases the Ca^{+2} levels in the blood
 (c) Thymosin play a major role in the differentiation of T-lymphocytes
 (d) Parathyroid glands are present on back side of the thyroid gland
 (1) b, c and d (2) a, b and c
 (3) a, c and d (4) a, b, c and d
- Which of the following pair is not matched correctly :-
 (1) Cretinism = Thyroid gland
 (2) Acromegaly = Pituitary gland
 (3) Addison's disease = Adrenal gland
 (4) Cushing's syndrome = Pineal gland
- Which of the following option does not include the antagonistic hormones :-
 (1) Insulin and glucagon
 (2) PTH and calcitonin
 (3) Epinephrine and oxytocin
 (4) MSH and melatonin
- Which one of the following condition is not linked to deficiency of thyroid hormones :-
 (1) Cretinism
 (2) Goitre
 (3) Myxedema
 (4) Exophthalmic goitre
- Which of the following are not present in cretinism :-
 (1) Low intelligence
 (2) Dwarfism
 (3) Deaf-mutism
 (4) Normal healthy skin

- Which of the following are the functions of thyroxine :-
 (A) Development of CNS
 (B) Stimulates erythropoiesis
 (C) Influence maintenance of water and electrolyte balance.
 (D) Regulates menstrual cycle
 (1) A, B, C and D (2) C and D
 (3) Only D (4) A and B only
- Identify the **correct** match from the columns-I, II and III

Column-I		Column-II		Column-III	
1.	Zona glomerulosa	a.	Cortisol	i.	Osmotic pressure maintenance
2.	Zona Fasciculata	b.	Androgenic steroids	ii.	Emergency hormone
3.	Adrenal medulla	c.	Aldosterone	iii.	Growth of axial hair at puberty
4.	Zona Reticularis	d.	Adrenaline	iv.	Anti-inflammatory response

- (1) 1-a-iv, 2-c-i, 3-d-ii, 4-b-iii
 (2) 1-c-i, 2-a-iv, 3-d-ii, 4-b-iii
 (3) 1-a-i, 2-c-iv, 3-d-ii, 4-b-iii
 (4) 1-b-iv, 2-a-i, 3-d-iii, 4-c-ii
- Cortisol hormone is produced by _____ and stimulates _____.
 (1) Adrenal medulla, gluconeogenesis
 (2) Adrenal cortex, gluconeogenesis
 (3) Adrenal medulla, glycogenolysis
 (4) Anterior pituitary, glycogenolysis

ENDOCRINE SYSTEM # 04(THYMUS, PINEAL, PANCREAS & GONADS)

- During time of stress body demands the releasing of cortisol having receptor present on/in :-
 (1) Cell membrane
 (2) Nucleus
 (3) Ribosome
 (4) Endoplasmic reticulum
- ____(A)____ induces ovulation of fully mature follicles and ____ (B)____ acts mainly at the kidney and stimulates resorption of water and electrolytes.

	A	B
(1)	FSH	ADH
(2)	LH	Oxytocin
(3)	LH	Vasopressin
(4)	LH	Prolactin

- Which of the following is correct about glucagon?
 (a) Stimulates glycogenolysis
 (b) Stimulates gluconeogenesis
 (c) Hypoglycemic hormone
 (1) a, c only
 (2) a, b only
 (3) b, c only
 (4) a, b, c all
- Given below is an incomplete table about certain hormones, their source glands and one major effect of each on the body in human. Identify the correct option for the three blanks A, B and C :

Gland	Secretion	Effect on Body
A	Oestrogen	Maintenance of secondary sexual characters
Alpha cells of Islets of Langerhans	B	Raises blood sugar level
Anterior pituitary	C	Over secretion leads to gigantism

Options :

	A	B	C
(1)	Ovary	Glucagon	Growth hormone
(2)	Placenta	Insulin	Vasopressin
(3)	Ovary	Insulin	Calcitonin
(4)	Placenta	Glucagon	Calcitonin

- Which of the following statement is false :-
 (1) Glucagon reduces cellular glucose uptake and utilisation.
 (2) Glucagon is a hyperglycemic hormone.
 (3) Insulin stimulates gluconeogenesis
 (4) Insulin stimulates glycogenesis
- 'Corpuscles of Hassall's' are present in :-
 (1) Thyroid (2) Pineal gland
 (3) Thymus (4) Adrenal gland
- Which of the given statement is false :-
 (1) Androgen play a role in the process of spermatogenesis.
 (2) Androgens act on the central neural system and influence the male sexual behaviour.
 (3) Androgens stimulate high pitch of voice in males
 (4) Androgens shows anabolic effect

8. Identify the correct match from column I, II and III.

Column-I		Column-II		Column-III	
(I)	ADH	(a)	Parathyroid	(i)	Tetany
(II)	PTH	(b)	Hypothalamus	(ii)	Diabetes mellitus
(III)	Insulin	(c)	Anterior pituitary	(iii)	Diabetes insipidus
(IV)	Growth hormone	(d)	Pancreas	(iv)	Dwarfism

- (1) I-b-ii, II-a-i, III-d-iii, IV-c-iv
 (2) I-b-iii, II-a-i, III-d-ii, IV-c-iv
 (3) I-c-iii, II-a-i, III-d-ii, IV-b-iv
 (4) I-c-ii, II-a-i, III-d-iii, IV-b-iv

9. Read the following statements (A–D)

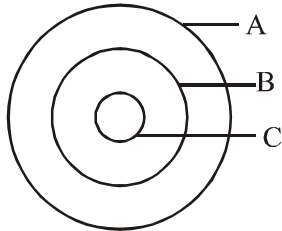
- (A) Intermedin causes dispersion of melanin pigment and is responsible for dark pigmentation.
 (B) Insulin is a peptide hypoglycemic hormone made up of a total of 51 amino acids.
 (C) Glucagon is antagonistic to insulin
 (D) Thymus gland originates from embryonic endoderm

How many of the above statements are **correct**?

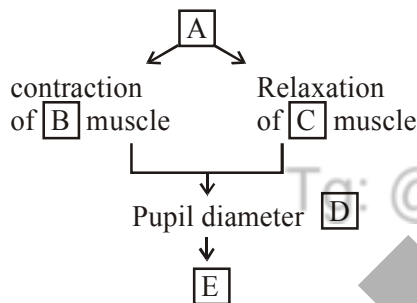
- (1) Four (2) One
 (3) Two (4) Three

SENSORY ORGANS (EYE)

1. A, B and C are three layers which form wall of eye ball, choose the correct option which contribute in the formation of wall of eye :-



- (1) A-choroid, B-cornea, C-Retina
(2) A-sclera, B-Ciliary body, C-Choroid
(3) A-Iris, B-pars ciliaris, C-Retina
(4) A-Sclera, B-ciliary body, C-retina
2. Choose the correct option regarding changes in iris:-

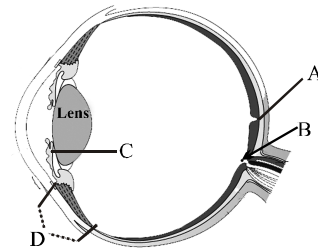


RDM = Radial Dilatory Muscles
CSM = Circular Sphincter Muscles

	A	B	C	D	E
1	Parasympathetic NS	RDM	CSM	increase	Mydriasis
2	Sympathetic NS	CSM	RDM	decrease	Miosis
3	Para sympathetic NS	CSM	RDM	increase	Miosis
4	Sympathetic NS	RDM	CSM	increase	Mydriasis

3. In our eyes optic nerve leaves and retinal blood vessels enter at a point called optic disc, Which is characteristed for this point by all except one?
- (1) Located medial to and slightly above the posterior pole
(2) Potoreceptor cells are absent
(3) Thinned out portion of retina where visual acuity is greatest
(4) Macula lutea is located on lateral side of it

4.



For the given diagram which labelling and function is correctly matched / described :-

- (1) A-fovea - Rods are densely packed
(2) B-optic disc - some photoreceptor cells present
(3) C-Iris - colour part of eye which help in adaptation
(4) D-ciliary body - no role in accomodation
5. Direction of light striking on the retina will be:-
- (1) photosensory cells → bipolar neuron layer → ganglionic cells → sensory nerve.
(2) sensory nerve → bipolar neurons → ganglionic cells → photosensory cells.
(3) sensory nerve fibre → ganglionic cells → bipolar neurons → photosensory cells
(4) Photo receptor cells → ganglionic cells → bipolar neurons → optic nerve
6. Visual acuity is greatest in retinal fovea, because of all except :-
- (1) Only cones are present in fovea
(2) Each foveal cones have its own optic nerve fibre.
(3) Cones of fovea slightly above the posterior pole and few rods are also found.
(4) Blood vessels and ganglionic cells do not cover foveal cones.

7. There are some functions of photoreceptor cells:-

Which of the following are not functions of rods.

- (A) day light vision (B) Twilight vision
(C) Scotopic vision (D) Colour vision
(E) Photopic vision (F) Dim light vision
(1) A, D, F (2) B, C, D
(3) A, D, E (4) All except B, D, F

8. Which of the following statement is **false** ?

- (1) Light induces dissociation of the retinal from opsin.
(2) Action potential is generated in photoreceptor cells.
(3) When red, green and blue cones are stimulated equally than sensation of white light is produced
(4) Action potential is transmitted by optic nerve to visual cortex area of brain.

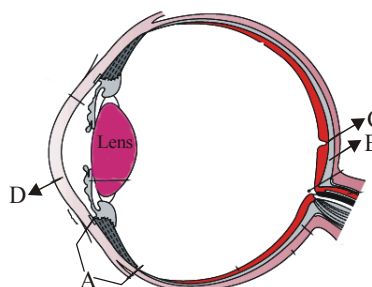
9. Which of the following pair is not matched correctly ?

- (1) Photopic vision = cones
(2) Scotopic vision = Rods
(3) Retinal = Ketone of vitamin A
(4) Opsin = Protein

10. Which of the following pair is not matched correctly ?

- (1) Cataract $\Rightarrow$ lens becomes opaque
(2) Night blindness $\Rightarrow$ deficiency of vitamin A
(3) Myopia $\Rightarrow$ image formed behind retina
(4) Xerophthalmia $\Rightarrow$ Keratinisation of conjunctiva

11.



Identify A,B,C and D in the given figure and Match the Column-I, II, and III :-

	Column-I		Column-II		Column-III
I	A	a	Choroid	i	Only cones present
II	B	b	Ciliary body	ii	Bluish in colour
III	C	c	Cornea	iii	Controls lens diameter
IV	D	d	Fovea	iv	Transparent layer

- (1) I-b-ii, II-a-iii, III-d-i, IV-c-iv
(2) I-b-iii, II-c-ii, III-d-i, IV-a-iv
(3) I-b-iii, II-a-ii, III-d-i, IV-c-iv
(4) I-c-iii, II-a-ii, III-d-i, IV-b-iv

12. Which of the following statements is **false** ?

- (1) Layer of cells in retina from inside to outside are - ganglion cells, bipolar cells and photoreceptor cells.
(2) The eyeball contains a transparent crystalline lens which is held in place by ligaments attached to iris only.
(3) The anterior portion of fibrous layer is termed as cornea.
(4) The choroid layer helps in prevention of internal reflection

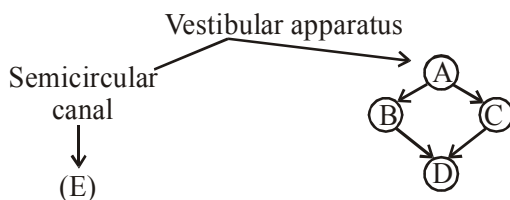
13. Color vision, Scotopic vision, Photopic vision, White & Black vision, Iodopsin, Dimlight, Rhodopsin, Bright light, Photoreceptor.

How many things related to Rod ?

- (1) Five (2) Six
(3) Seven (4) Eight

SENSORY ORGANS (EAR)

- Which part of ear is influenced by gravity and movement ?
(1) Vestibular apparatus (2) Cochlea
(3) Organ of Corti (4) Ear ossicle
- Eustachian tube connects :-
(1) External ear with middle ear
(2) External ear with internal ear
(3) Middle ear with internal ear
(4) Middle ear with pharynx
- Recognize the figure and find out correct matching:-



	A	B	C	D	E
1	Saccule	Crista	macula	ampulla	utricle
2	Otolith organ	Saccule	utricle	ampulla	macula
3	Otolith organ	Saccule	utricle	macula	ampulla
4	Crista ampullaris	ampulla	macula	ampulla	otolith organ

- Air pressure in middle ear is maintained by :-
(1) Tympanic membrane
(2) Ear ossicles
(3) Eustachian tube
(4) Round window
- In organ of Corti, above the rows of hair cells a thin elastic membrane is present called as :-
(1) Reissner's membrane
(2) Basilar membrane
(3) Tectorial membrane
(4) Tympanic membrane
- At the base of cochlea, the scala vestibuli ends at the __ (a) __ window, while the scala tympani terminates at the __ (b) __ window which open to the middle ear. :-
(1) a - round, b - oval
(2) a - oval, b - round
(3) a - spherical, b - fenestra rotundus
(4) a - circular, b - spherical

- Static equilibrium is the function of which of the following :-
(1) Cochlea (2) crista
(3) Cupula (4) Macula
- Which of the following pair is not matched correctly ?
(1) Stapes $\Rightarrow$ Smallest bone of body
(2) Incus $\Rightarrow$ Anvil shaped
(3) Malleus $\Rightarrow$ Stirrup shaped
(4) Incus $\Rightarrow$ Formed by modification of quadrate bone
- Match the column-I, II and III :-

	Column-I		Column-II		Column-III
I	Malleus	a	yellow elastic cartilage	i	Hammer shape
II	Incus	b	Articular bone	ii	Muscles vestigial
III	Stapes	c	Quadrate bone	iii	Anvil shape
IV	Pinna	d	Hyomandibular bone	iv	Stirrup shape

- (1) I-c-i, II-b-ii, III-d-iv, IV-a-ii
(2) I-b-i, II-d-iii, III-c-iv, IV-a-ii
(3) I-b-i, II-c-iv, III-d-iii, IV-a-ii
(4) I-b-i, II-c-iii, III-d-iv, IV-a-ii
- Read the table carefully and choose correct answer

Crista	A
Static balance	B
Organ of corti	C

- (1) A - Dynamic balance, B - Maculae, C - Tectorial membrane
(2) A - Dynamic balance, B - Ampulla, C - Hearing
(3) A - Hearing, B - Maculae, C - Dynamic balance
(4) A - Dynamic balance, B - Organ of corti, C - Hearing

HUMAN REPRODUCTION # 01 (The Male Reproductive System)

1. Read the given statements and choose correct option about them :-
- (A) Each lobule of testis contains one to three highly coiled seminiferous tubules and it is lined inside by only columnar cells
- (B) The vasa efferentia leave the testis and open into vas deferens
- (C) Functional maturation of sperms take place in epididymis.
- (D) Seminal plasma is rich in fructose, calcium and certain enzymes.

	A	B	C	D
(1)	True	False	True	True
(2)	False	False	True	True
(3)	False	False	False	False
(4)	True	True	False	False

2. Fill in the blanks in the following statements :-
- The human male ejaculates about million sperms during a coitus of which, for normal fertility, at least percent sperms must have normal shape and size and at least percent of them must show vigorous motility.

- (1) 400 - 500, 60, 40
- (2) 100 - 120, 40, 60
- (3) 200 - 300, 60, 40
- (4) 200 - 300, 40, 60

3. Which of the following statements is not correct about scrotum ?

- (1) The temperature of scrotum is $2-2.5^{\circ}\text{C}$ lower than normal body temperature.
- (2) Scrotum is connected to the abdominal cavity through a passage termed as inguinal canal.
- (3) During embryonic stage, testes develop in scrotum and remain in scrotum at the time of birth.
- (4) Scrotum is a small bag like structure situated below abdominal cavity.

4. Read the following four statements about the function of sertoli cell and answer the question given below.

- (A) To provide the nutrition of sperm.
- (B) To phagocyte the dead or injured sperm.
- (C) Secretions of testosterone.
- (D) Conversion of oestrogen into progesterone.
- Which set of option is incorrect statements ?

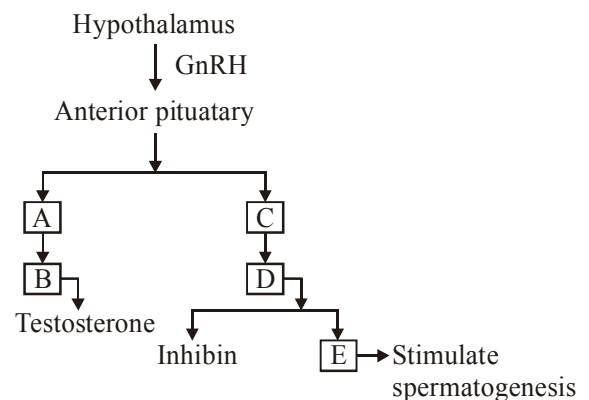
- (1) A & B
- (2) C & D
- (3) A & C
- (4) B & D

5. Identify the correct pair :-

	Hormones		Function
I	Inhibin	a	Development of secondary sexual characters of male
II	Androgen binding protein (ABP)	b	Stimulates Leydig cells to secrete testosterone
III	Testosterone	c	Concentrates testosterone inside seminiferous tubule
IV	LH	d	Suppression of synthesis and release of FSH

- (1) I-d, II-b, III-a, IV-c
- (2) I-d, II-c, III-a, IV-b
- (3) I-c, II-d, III-a, IV-b
- (4) I-c, II-b, III-a, IV-d

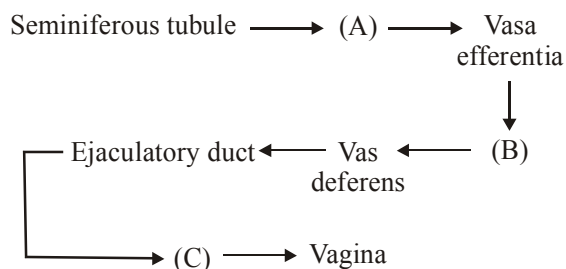
- 6.



Find out A, B, C and E respectively :-

	A	B	C	D	E
(1)	Testis	Leyding cells	Sertoli cells	AMH	ABP
(2)	ICSH	Testis	AMH	Sertoli cells	ABP
(3)	LH	Interstitial cells	FSH	Sertoli cells	AMH
(4)	ICSH	Leyding cells	FSH	Sertoli cells	ABP

7. Here path of sperms in mammals is shown :-

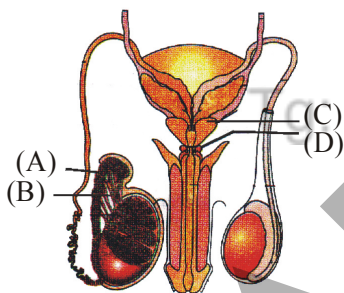


A, B & C respectively are -

	A	B	C
(1)	Epididymis	Testes	Urethra
(2)	Rete testis	Epididymis	Urethra
(3)	Ovary	Epididymis	Uterus
(4)	Testes	Rete testis	Epididymis

8. Identify A, B, C and D in the given diagram.

Which of them has been correctly identified along with its function :-



(1)	(A)	Epididymis	Formation of sperm
(2)	(B)	Rete testis	Functional maturation of sperms
(3)	(C)	Seminal vesicle	store and transport the sperms
(4)	(D)	Bulbourethral	destroy the acidity of urethra

9. Which structures form the extratesticular pathways for sperms?

- (1) Seminiferous tubules, Epididymis, Vas deferens
- (2) Seminiferous tubules, Vasa efferentia, Epididymis
- (3) Epididymis, Vas deferens, Ejaculatory duct
- (4) Rete testis, Epididymis, Vas deferens

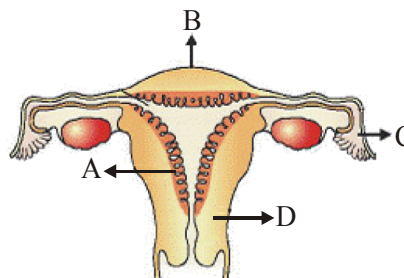
10. After some time of ejaculation, semen liquefies due to presence of an enzyme which is found in secretion of :-

- (1) Vagina
- (2) Seminal vesicle
- (3) Prostate
- (4) Cowper's gland

HUMAN REPRODUCTION # 02 (The Female Reproductive System)

- Choose the correct option regarding mammary gland :-
 - (1) Areola is a non-pigmented and sensitive area around nipple
 - (2) Prolactin act on mammary ampulla and stimulate for milk synthesis
 - (3) The glandular tissue of each breast is divide into 2–5 mammary Lobes
 - (4) The cells of alveoli secrete milk
- Read the given statements and select the statements which are correct :-
 - (A) The uterus is single pair and is also called womb
 - (B) The shape of uterus is like an inverted pear
 - (C) The uterus open into vagina through a narrow cervix
 - (D) Birth canal is formed by cervical canal and vaginal canal
 - (E) Perimetrium of uterus wall is outermost and thick glandular layer
 - (1) A, B & C
 - (2) B, C & D
 - (3) D & E
 - (4) A & E
- Which of the following statement is incorrect regarding female external genitalia ?
 - (1) Mons pubis is a cushion of fatty tissue covered by skin and pubic hairs
 - (2) Clitoris lies at the upper junction of labia minora below the urethral opening
 - (3) Hymen is not a reliable indicator of virginity
 - (4) Labia majora are fleshy folds of tissue
- A functional mammary gland is the characteristic feature of :-
 - (1) All mammals
 - (2) All primates
 - (3) All male mammals
 - (4) All female mammals

- Given diagram is of female reproductive system Identify the structures which are marked as A, B, C and D :-



	A	B	C	D
1.	Endometrium	Uterine cavity	Infundibulum	Vagina
2.	Myometrium	Uterine cavity	Infundibulum	Cervix
3.	Endometrium	Uterine fundus	Infundibulum	Cervix
4.	Perim etrium	Uterine fundus	Infundibulum	Cervix

- If ampulla of mammary gland is blocked, the milk will not go from :-
 - (1) Alveoli to mammary duct
 - (2) Mammary tubule to mammary duct
 - (3) Mammary duct to lactiferous duct
 - (4) Mammary duct to mammary tubule
- There are three layers present in uterus, one of them is thick muscular, second is thin visceral peritoneum and third glandular layer. Identify layers respectively :-
 - (1) Perimetrium, Myometrium, Endometrium
 - (2) Endometrium, Myometrium, Perimetrium
 - (3) Myometrium, perimetrium, Endometrium
 - (4) Myometrium, endometrium, Perimetrium

8. Read the following
- (A) It is a thick layer of smooth muscles
 - (B) It is highly glandular layer
 - (C) It exhibits strong contraction during delivery of the baby
 - (D) It is a thin membranous layer
- Which of the above statements are correct with respect to myometrium?
- (1) A and B
 - (2) B, C and D
 - (3) A and C
 - (4) A, B and C
9. The ovaries are located one on each side of the lower abdomen and is connected to pelvic wall and uterus by :-
- (1) Ligament
 - (2) Tendon
 - (3) Loose connective tissue
 - (4) Dense irregular connective tissue
10. Which is incorrectly matched pair among these?
- (1) Labia majora – 1 pair
 - (2) Labia minora – 1 pair
 - (3) Clitoris – 1 pair
 - (4) Bartholin's gland – 1 pair

HUMAN REPRODUCTION # 03 (Gametogenesis)

1. Find out the correct match from the following table.

	Column I	Column II	Column III
(i)	Primary Spermatocyte	(n)	Maturation phase
(ii)	Secondary Spermatocyte	(n)	Maturation phase
(iii)	Spermatid	(n)	Maturation phase

- (1) (i) only (2) (i) and (ii)
(3) (ii) only (4) (ii) and (iii)

2. Read the following statements carefully.

The(A)..... present on the inside wall of(B)..... multiply by(C)..... division. A(D)..... completes the(E)..... division leading to formation of two equal, haploid cells called(F)..... .

Which one of the following options gives the correct filling of A, B, C, D, E and F ?

	A	B	C	D	E	F
(1)	Spermatogonia	Seminiferous tubule	Mitotic	Primary Spermatocyte	First meiotic	Secondary Spermatocyte
(2)	Primary Spermatocyte	Sertoli Cell	Mitotic	Secondary Spermatocyte	First meiotic	Spermatid
(3)	Spermatogonia	Sertoli Cell	First meiotic	Secondary Spermatocyte	Second meiotic	Spermatid
(4)	Primary Spermatocyte	Seminiferous tubule	First meiotic	Spermatid	Second meiotic	Sperm

3. During Oogenesis in human, first maturation division starts ___A___ and completes ___B___.

- (1) A-Before birth, B-Just prior to ovulation
(2) A-After birth, B-Before menopause
(3) A-Before ovulation, B-After entry of sperm
(4) A-Before ovulation, B-After fertilisation

4. How many structures in the list given below are haploid ?

Spermatid, secondary oocyte, primary spermatocyte, ovum, sperm, oogonia, spermatogonia, polar body

- (1) Six (2) Four
(3) Two (4) Five

5. Which one of the following structure of sperm is mismatched?

- (1) Acrosome - Filled with enzyme that help in fertilisation of the ovum
(2) Nucleus - Contains an elongated and haploid nucleus
(3) Proximal centriole - Starts cleavage in zygote
(4) Tail - Contains numerous mitochondria, which produce energy for movement of tail

6. If germ cells in female and male gonads begin undergoing meiosis simultaneously. What will be ratio of ova and sperms produced?

- (1) 1 : 1 (2) 1 : 2
(3) 1 : 4 (4) 2 : 1

7. Spermatogenesis starts at the age of puberty due to :-

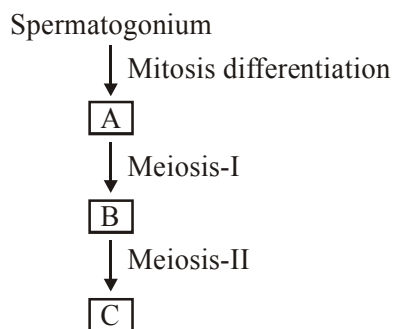
- (1) Significant increase in growth hormones in male body
(2) Significant increase in number of germ cells
(3) Significant increase in GnRH secreted from hypothalamus.
(4) Significant decrease in GnRH secreted from hypothalamus

8. Consider the following statements (a-d) and select the options, which includes all the correct ones only :

- (a) Maturation phase is the longest phase in oogenesis process of human.
(b) Oogenesis is initiated at puberty.
(c) Primary oocyte temporarily arrested in prophase-I stage.
(d) During oogenesis meiotic-I division is an equal division leading to formation of secondary oocyte and polar body.

- (1) Statement (a), (b), (c)
(2) Statement (a), (c)
(3) Statement (b), (d)
(4) Statement (a), (d)

9. Identify A, B and C in following figure :-



- (1) A-Secondary spermatocyte, B-Primary spermatocyte, C-Spermatids
- (2) A-spermatid, B-Primary spermatocyte, C-Secondary spermatocyte
- (3) A-Spermatid, B-Secondary spermatocyte, C-Primary spermatocyte
- (4) A-Primary spermatocyte, B-Secondary spermatocyte, C-spermatid

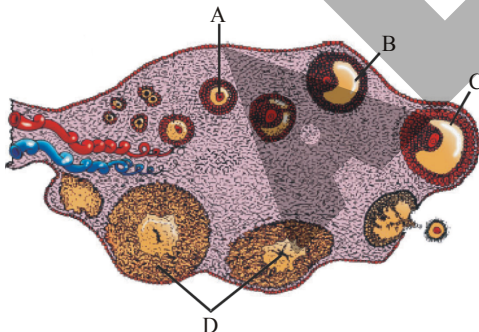
10. At the time of puberty total how many primary follicles are left in human female ?

- (1) 60,000 – 80,000
- (2) 40,000 – 60,000
- (3) 1,20,000 – 1,60,000
- (4) 80,000 – 1,20,000

HUMAN REPRODUCTION # 04

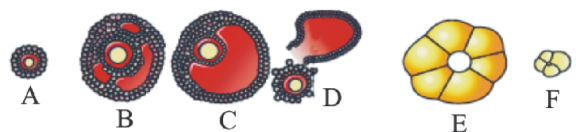
(Internal Structure of Ovary and Follicular development & Menstrual Cycle)

- Level of which hormone reaches peak during follicular phase of menstrual cycle ?
(1) Estrogen
(2) Progesterone and estrogen
(3) Luteinizing hormone and hCG
(4) F.S.H. and progesterone
- How many statement are correct :-
(A) Corpus luteum secretes large amount of progesterone which is essential for the maintenance of endometrium.
(B) Maintenance of endometrium is necessary for implantation of fertilised ovum and other events of pregnancy.
(C) During pregnancy all events of menstrual cycle stop.
(D) In absence of fertilization, the corpus luteum degenerates this cause disintegration of the endometrium leading to menstruation.
(1) 1 (2) 2 (3) 3 (4) 4
- Following is diagrammatic sectional view of ovary with labelled parts A, B, C and D. Find out the incorrect identification of the labelled part and its description.



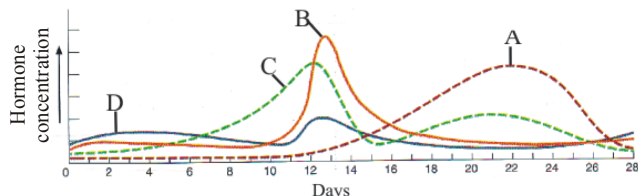
	Structure	Identification	Description/Function
(1)	A	Primary follicle	About 60,000-80,000 left in each ovary at puberty
(2)	B	Secondary follicle	Contains primary oocyte
(3)	C	Graafian follicle	Mature follicle containing secondary oocyte
(4)	D	Corpus luteum	Developed by the activity of LH, secrete mainly progesterone and some amount of estrogen

- Considered the following four statements (a-d) and select the option which include all correct ones only :
(a) Estrogen causes myometrial hypertrophy
(b) Progesterone decreases myometrial contraction
(c) Pre-ovulatory phase also known as progesterone phase
(d) Oestrogen causes endometrial hyperplasia.
Options :-
(1) Statement (a), (c) and (d)
(2) Statement (a), (b) and (c)
(3) Statement (a), (b) and (d)
(4) Statement (b), (c) and (d)
- In a female, undergoing hysterectomy, which one of the following will not occur ?
(1) Formation of Graafian follicle
(2) Ovulation
(3) Menstruation
(4) Completion of meiosis-I and formation of secondary oocyte
- It is a diagrammatic representation of developing follicle events, identify the structure and choose correct option :-



- (1) A = Primary follicle, C = secondary follicle, E = Corpus haemorrhagicum, F = Corpus luteum
(2) B = Secondary follicle, D = Mature follicle, E = Corpus haemorrhagicum, F = Corpus luteum
- (3) A = Primary follicle, C = mature follicle, E = Corpus luteum, F = Corpus albicans
(4) A = Primary follicle, D = Mature follicle, E = Corpus luteum, F = Corpus albicans

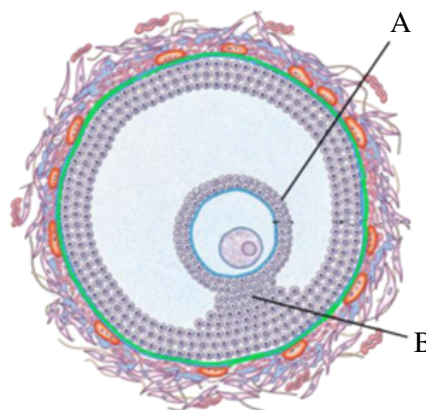
7. The figure given below show different phase of menstruation cycle's hormones. Select the option which gives correct identification together with its source of secretion.



(b) Changes in concentration of anterior pituitary and ovarian hormones

- (1) B–Estrogen ; Theca externa
(2) C–LH ; Graafian follicle
(3) A–Progesterone ; Corpus albicans
(4) D–FSH ; Anterior pituitary gland
8. Which one of the following is the correct matching of the events occurring during the menstrual cycle ?
- (1) Menstruation : Breakdown of myometrium and ovum not fertilised
(2) Ovulation : LH and FSH attain peak level and sharp fall in the secretion of progesterone.
(3) Proliferative phase : Rapid regeneration of myometrium and maturation of corpus luteum.
(4) Secretory phase : Development of corpus luteum and increased secretion of progesterone.
9. Arrange following events of female reproductive cycle in (human) in sequence :-
- (I) Secretion of FSH
(II) Growth of corpus luteum
(III) Growth of follicles
(IV) Ovulation
(V) Sudden increase in level of LH.
(VI) Formation of corpus albicans
- (1) III → I → IV → II → VI → V
(2) I → III → V → IV → II → VI
(3) I → IV → III → V → II → VI
(4) II → I → III → IV → VI → V

10. Identify A and B given diagram :-



	A	B
(1)	Cumulus oophorous	Discus proligerous
(2)	Discus proligerous	Cumulus oophorous
(3)	Zona pellucida	Cumulus oophorous
(4)	Cumulus oophorous	Zona pellucida

HUMAN REPRODUCTION # 05

(Structure of Human egg, Fertilization, Cleavage, Embryonic Development and Parturation)

1. Match the column-A and B about the embryonic development of human :-

	Column-A		Column-B
(i)	End of one month	(a)	Most of the major organ systems developed
(ii)	End of second month	(b)	Appearance of hair on the head
(iii)	End of 12 weeks	(c)	Heart formation
(iv)	During fifth month	(d)	Eye lid separated
(v)	End of about 24 weeks	(e)	Limbs and digits formation

	(i)	(ii)	(iii)	(iv)	(v)
(1)	c	e	a	b	d
(2)	c	a	e	d	b
(3)	c	e	b	a	d
(4)	d	e	b	a	c

2. What is wrong about cleavage?
- (1) Size of blastomeres continues to decrease
 - (2) Interphase is very long during cell cycle
 - (3) No significance of synthesis of cytoplasm takes place
 - (4) Karyoplasmic index of blastomeres increases after each cleavage
3. Fertilisation has following processes :-
- (a) Plasmogamy
 - (b) Karyogamy
 - (c) Syngamy
 - (d) Amphimixis
- Arrange these in correct sequence :
- (1) $a \rightarrow b \rightarrow c \rightarrow d$
 - (2) $b \rightarrow a \rightarrow d \rightarrow c$
 - (3) $c \rightarrow a \rightarrow b \rightarrow d$
 - (4) $c \rightarrow a \rightarrow d \rightarrow b$
4. Perivitelline space is occurs between :-
- (1) Zona pellucida and cells of corona radiata
 - (2) Sperms and zona pellucida
 - (3) Sperms and cells of corona radiata
 - (4) Membrane of ovum and zona pellucida

5. The figure below show four stage (a, b, c, d) of human development. Select the option giving correct identification together with site of occurrence ?

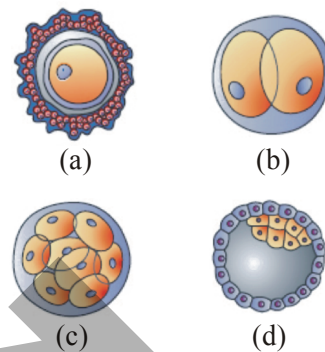
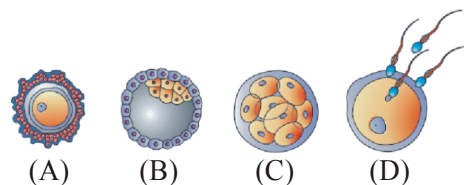


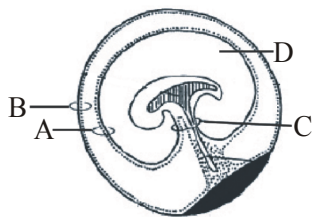
	Figure	Developmental stage	Site of occurrence
(1)	(a)	Fertilised egg	Isthmus part of fallopian tube
(2)	(b)	Zygote	End part of fallopian tube
(3)	(c)	Mórula	Starting point of Fallopian tube
(4)	(d)	Blastocyst	Uterine cavity

6. Choose the correct sequence for given diagrams (A,B,C and D) of human development events :-



- (1) $A \rightarrow B \rightarrow C \rightarrow D$
- (2) $B \rightarrow C \rightarrow A \rightarrow D$
- (3) $C \rightarrow B \rightarrow A \rightarrow D$
- (4) $A \rightarrow D \rightarrow C \rightarrow B$

7.



Identify the A, B, C and D

- (1) A–Amnion B–Chorion
C–Umbilical cord D–Amniotic cavity
(2) A–Chorion B–Amnion
C–Amniotic cavity D–Umbilical cord
(3) A–Amnion B–Chorion
C–Amniotic cavity D–Umbilical cord
(4) A–Umbilical cord B–Amniotic cavity
C–Chorion D–Amnion

8. Match the following and choose the correct answer :-

(a)	Inner cell mass	(i)	Embedding of blastocyst in the endometrium
(b)	Cleavage	(ii)	Group of cells that would differentiate as embryo
(c)	Trophoblast	(iii)	Outer layer of blastocyst attached to the endometrium
(d)	Implantation	(iv)	Mitotic division of zygote

- (1) a-(ii), b-(i), c-(iii), d-(iv)
(2) a-(iii), b-(iv), c-(ii), d-(i)
(3) a-(ii), b-(iv), c-(iii), d-(i)
(4) a-(iii), b-(i), c-(ii), d-(iv)

9. Consider the following statements and select the wrong one :-

- (1) Parturition is a complex neuro endocrine mechanism
(2) The first movement of the foetus & appearance of hairs on the head are usually observed during fifth month of pregnancy
(3) During parturition, secretion of progesterone decreases but secretion of estrogen increases from placenta
(4) Progesterone and estrogen are produced in women only during pregnancy

10. Which one of the following is not the function of placenta? It:-

- (1) Facilitates supply of oxygen and nutrients to embryo
(2) Secretes estrogen and progesterone
(3) Facilitates removal of CO_2 and waste material from embryo
(4) Facilitates supply of blood to embryo from mother

REPRODUCTIVE HEALTH

- Which of the following is an indicative of improved reproductive health of the society ?
 (a) Better awareness about sex related matters
 (b) Increased number of medically assisted deliveries
 (c) Better post-natal care
 (d) Increased maternal and infant mortality rates
 (e) Decreased number of couples with small families
 (f) Better detection and cure of STDs
 (g) Overall increased medical facilities for all sex-related problems
 (1) a, c, d and g
 (2) a, e and f
 (3) a, b, d, e and f
 (4) a, b, c, f and g
- Diaphragms, cervical caps and vaults prevent conception by :-
 (1) Increasing phagocytosis of sperms within uterus
 (2) Suppressing sperm motility
 (3) Inhibiting ovulation and implantation
 (4) Blocking the entry of sperms through the cervix
- Primary steps that can be taken towards attaining reproductive health are :-
 (a) Counselling and creating awareness among people about reproductive organs, adolescence and associated changes.
 (b) Safe and hygienic sexual practices
 (c) Creating awareness about STDs including AIDS, etc
 (d) Ban on MTP and amniocentesis
 (1) a and b (2) b and c
 (3) a, b and c (4) a, b, c and d
- Medical assistance and care to people is required in reproduction related problems like:-
 (a) Pregnancy (b) Delivery
 (c) STDs (d) Abortions
 (e) Contraception (f) Menstrual problems
 (g) Infertility
 (1) a,c,e, and f
 (2) b,d and g
 (3) a, b, c, d e and g
 (4) a,b,c,d,e,f and g

- Which of the following is not true about lactational amenorrhoea.
 (1) Inhibition of menstrual cycle in lactating mother is due to high concentration of prolactin
 (2) As a natural method of contraception, it has been reported to be effective only upto a maximum period of six months following parturition
 (3) Side effects are almost nil, if we consider it as a natural method of contraception
 (4) Chances of failure of this natural method of contraception are very low
- Match the column-I, II and III and choose the correct option.

Column-I Contraceptive method	Column-II Example	Column-III Mode of action
A Copper releasing IUD's	i Nim-76	a Suppress sperm motility
B Weekly oral pills	ii LNG-20	b Act as spermicidal agent
C Hormone releasing IUD's	iii Multiload-375	c Anti estrogenic activity in uterus
D Chemical method	iv Saheli	d Makes uterus unsuitable for implantation and cervix hostile to sperms

- (1) A-iii-a, B-iv-c, C-ii-d, D-i-b
 (2) A-ii-b, B-iv-d, C-i-a, D-iii-c
 (3) A-ii-c, B-i-a, C-iii-d, D-iv-b
 (4) A-iii-a, B-iv-d, C-ii-b, D-i-c
- Consider the following statements given below and choose the option. Which include correct statements only ?
 (A) Contraception pills include administration of progesterone or progesterone-estrogen combinations.
 (B) Medical termination of pregnancy (MTP) is safe during third trimester.
 (C) First seven days and last seven days of menstrual cycle is called risk period.
 (D) Intrauterine devices like Cu-T are effective contraceptives.
 (1) B & D (2) A & D
 (3) B & C (4) A, B & D

8. In the given four statements (A–D) select the options which include all the correct ones only:-
- (A) Tubectomy is the terminal method of contraception in males
- (B) Oral pills prevent the ovulation from ovary.
- (C) Copper releasing IUD's release Cu ions which suppress sperm motility and the fertilizing capacity of sperm.
- (D) Condoms are the barrier method of conception.
- (1) Statement A, B, C
 (2) Statement B, C, D
 (3) Statement A, C, D
 (4) Statement A, B, D
9. Choose the incorrect for MTP :-
- (1) Nearly 45 to 50 million MTPs are performed in a year all over India
- (2) Government of India legalised MTP in 1971
- (3) MTPs are considered relatively safe during the first trimester
- (4) It is also called induced abortion
10. The technique called gamete intrafallopian transfer (GIFT) is recommended for those females :-
- (1) Whose cervical canal is too narrow to allow passage for the sperms.
- (2) Who can not provide suitable environment for fertilisation.
- (3) Who fail to produce an ovum
- (4) Who fail to retain the foetus inside uterus
11. Given below are four statements (a-d) regarding assisted reproductive technologies:-
- (a) **ZIFT** - The zygote or early embryo (with upto 8 blastomere) transferred into the fallopian tube
- (b) **ICSI** - A sperm is directly injected into the fallopian tube to form an embryo in the laboratory
- (c) **IUI** - The semen collected either from the husband or healthy donor is artificially introduced into the uterus
- (d) **GIFT** - Transfer of zygote collected from a donor into the fallopian tube of another female who cannot produce ovum but can provide suitable environment for fertilisation and development
- Which two of the above statements are correct?
- (1) a and d (2) b and c
 (3) a and c (4) b and d
12. Given below are some assisted reproductive technologies (ARTs), in which how many technologies involve(s) invitro fertilisation ? GIFT, ZIFT, ICSI, IUT, IUI
- (1) Four (2) Three
 (3) Two (4) Only one
13. In _____ the egg is first fertilised outside the body and then it is inserted into the oviduct.
- (1) GIFT (2) ZIFT (3) AI (4) IUI
14. The mechanism of action of non medicated IUD's is
- (1) To suppress motility and fertilizing capacity of sperms
- (2) To make the uterus unsuitable for implantation and cervix hostile to the uterus
- (3) To prevent the ovulation from ovary
- (4) To promote phagocytosis of sperms within the uterus
15. Here are some statements about recent amendment in MTP act, find the incorrect one:
- (1) Its intention was to reduce illegal abortions, and consequent maternal mortality and morbidity.
- (2) It was amended in 2017
- (3) If pregnancy has lasted more than 24 weeks but less than 36 weeks, two registered medical practitioners must be of opinion that ground required for MTP exists
- (4) MTP can be performed if there is risk for pregnant woman or the child if born will suffer from physical or mental abnormality as to be seriously handicapped.

SEXUAL REPRODUCTION IN FLOWERING PLANTS # 01

1. The function of innermost layer of anther is:
 - (1) Dehiscence (2) Mechanical
 - (3) Protective (4) Nutritive
2. In flowering plants, sporogenous tissue gives rise to –
 - (1) Only the wall of the sporangium
 - (2) Both wall and the sporogenous cells
 - (3) Microspore tetrad
 - (4) Only tapetum and sporogenous cells
3. Which of the following statements are correct?
 - (1) Pollen grains are rich in nutrients.
 - (2) In some cereals like rice and wheat pollen grains lose viability within 30 minutes of their release
 - (3) In some members of rosaceae, leguminosae and solanaceae, pollen grains maintain viability for months
 - (4) All of the above
4. What would be the ploidy of cells of tetrad ?
 - (1) n (2) 2n
 - (3) 3n (4) 4n
5. Each lobe of a typical anther in angiosperm having two theca it is called :
 - (1) Monothealous
 - (2) Dithealous
 - (3) Monosporangiate
 - (4) Tetrasporangiate
6. Which of the following is not a pollen grain caused disease?
 - (1) Asthma (2) Bronchitis
 - (3) Hayfever (4) Malaria
7. From outer to inner, what is the sequence of wall layers in anther lobes?
 - (1) Epidermis, middle layers, tapetum, endothecium
 - (2) Epidermis, endothecium, tapetum, middle layers
 - (3) Epidermis, endothecium, middle layers, tapetum
 - (4) Tapetum, middle layers, endothecium, epidermis
8. What is the duration of juvenile phase in bamboo and *Strobilanthus kunthiana* respectively :
 - (1) 50-100 years and 21 years
 - (2) 50-100 years and 12 years
 - (3) 25-300 years and 12 years
 - (4) 25-30 years and 21 years
9. Sporopollenin is a :-
 - (1) Polymer of amins acids
 - (2) Polymer of carotenoids
 - (3) Polymer of NAG
 - (4) Polymer of ribose sugar
10. An example of monocarpic plant is ?
 - (1) Mango (2) Apple
 - (3) Lemon (4) Bamboo

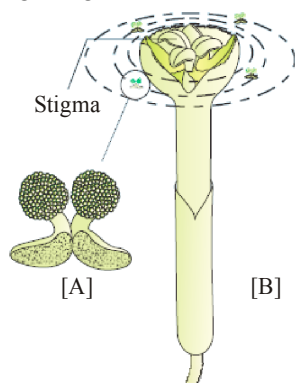
SEXUAL REPRODUCTION IN FLOWERING PLANTS # 02

1. Read the following four statements (A-D) :-
 (A) Both wind and water pollinated flowers are not very colourful and do not produce nectar.
 (B) Wind pollinated flowers often have a single ovule in each ovary
 (C) Wind pollinated pollens are light and non sticky
 (D) *Vallisneria* is an aquatic plant but it is pollinated by insect

How many of the above statements are correct?

- (1) One (2) Two
 (3) Three (4) Four
2. If pollen release and stigma receptivity within a flower is non synchronised then it is known as :-
 (1) Dichogamy (2) Homogamy
 (3) Heterostyly (4) Cleistogamy
3. Which of the following statements are correct?
 (1) The body of ovule fuses with funicle in the region called chalaza
 (2) Polar nuclei are situated in the central cell above the egg apparatus
 (3) Cleistogamous flowers are invariably autogamous
 (4) Antipodal cells are present towards the micropylar end

4. Following diagrams (A) & (B) represent ?



- (1) (A) Female flower of *Hydrilla*

- (B) Male flower of *Hydrilla*
 (2) (A) Male flower of *Hydrilla*
 (B) Female flower of *Hydrilla*
 (3) (A) Female flower of *Vallisneria*
 (B) Male flower of *Vallisneria*
 (4) (A) Male flower of *Vallisneria*
 (B) Female flower of *Vallisneria*

5. In which set of plants an ovary contains one ovule.
 (1) Papaya, water melon, orchids
 (2) Wheat, paddy, mango
 (3) Papaya, water melon, mango
 (4) Papaya, water melon, wheat
6. The functional megaspore generally undergoes:
 (1) 2 meiotic divisions to form mature embryo sac
 (2) 3 mitotic divisions to form mature embryo sac
 (3) 2 mitotic divisions to form mature embryo sac
 (4) 3 meiotic divisions to form mature embryo sac
7. The number of ovules in an ovary may be
 (1) One (2) Many
 (3) Two (4) One to many
8. Each ovule has one or two protective envelopes called
 (1) Micropyle (2) Integuments
 (3) Hilum (4) Chalaza
9. Chalaza represents the
 (1) Tip of the ovule
 (2) Base of the ovule
 (3) Both (1) & (2)
 (4) Stalk of the ovule
10. Polar nuclei are situated in the central cell
 (1) Below the egg apparatus
 (2) Above the egg apparatus

SEXUAL REPRODUCTION IN FLOWERING PLANTS # 03

1. Pollen tube releases :-
 - (1) One male gamete in the cytoplasm of synergid & other in the cytoplasm of central cell
 - (2) Two male gametes in the cytoplasm of central cell
 - (3) Two male gametes in the cytoplasm of Antipodal cell
 - (4) Two male gametes in the cytoplasm of synergid
2. In a flowering plant, how many division/s is/ are required for the formation of mature male gametophyte from mature pollen grain (having two cells) –
 - (1) 1 meiotic division is required
 - (2) 1 meiotic and 1 mitotic divisions are required
 - (3) 1 mitotic division is required
 - (4) 1 meiotic and 2 mitotic divisions are required
3. The first cell of male gametophyte in flowering plant is ?
 - (1) Microspore mother cell
 - (2) Megaspore mother cell
 - (3) Male gamete
 - (4) Microspore
4. How many meiosis are required for the formation of 80 male gametes in a typical flowering plant?
 - (1) 20 (2) 10 (3) 80 (4) 64
5. How many in the list given below are diploid in a typical angiosperm plant.
Endothecium, Middle layer, Perisperm, Egg cell, Antipodals, Synergids, Nucellus, Integuments, Pollen grain, Endosperm, Embryosac.
 - (1) four (2) five (3) six (4) seven
6. Read the following four statements (A-D) with respect to flowering plants :-
 - (A) Ploidy of the cells of the tetrad is haploid.
 - (B) The stigma serves as a landing platform for pollen grains.
 - (C) Pollen grains are generally spherical measuring about 100-200 micrometers in diameter.
 - (D) Exine of pollen grain has prominent apertures, called germ pores, where sporopollenin is absent.
 How many of the above statements are correct?
 - (1) One (2) Two
 - (3) Three (4) Four
7. In which of the following plants, the nucellar cells start dividing and develop into the embryos ?
 - (1) *Citrus* and mango
 - (2) *Parthenium* and grasses
 - (3) Pea and gram
 - (4) Wheat and rice
8. Fruit production without fertilisation is called?
 - (1) Parthenogenesis (2) Parthenocarp
 - (3) Polyembryony (4) Amphimixis
9. The zygote gives rise to the.....and subsequently to the globular, heart shaped and mature embryo.
 - (1) Torpedo embryo
 - (2) Endosperm
 - (3) Proembryo
 - (4) All of the above
10. In which of the following, endosperm persists in the mature seed ?
 - (1) Pea (2) Bean
 - (3) Groundnut (4) Castor

PRINCIPAL OF INHERITANCE # 01 (INTRODUCTION TO RECIPROCAL CROSS)

- The character which can express only in homozygous condition in case of garden pea is -
(A) Constricted pod
(B) Green seed colour
(C) Axial flower
(D) Yellow pod colour
(1) A, B & D (2) A, C & D
(3) B, C & D (4) A, B & C
- Mendel published his work on inheritance of characters in 1865, but it remained unrecognised till 1900 due to the reason (s)
(A) Communication was not easy in those days.
(B) His contemporaries did not accept factors as discrete units of heredity.
(C) Mathematical approach to explain inheritance was totally new.
(D) Mendel could not provide any physical proof for the existence of factors
(1) Only A and B are correct
(2) Only B and C are correct
(3) Only C and D are correct
(4) All are correct.
- Which is not true for test cross -
(1) F_2 Dihybrid test cross ratio is 1 : 1 : 1 : 1
(2) Performed to know the alleles of a gene in an individual.
(3) A test cross is a back cross
(4) Dominant offsprings in test cross is always homozygous.
- What percentage of offsprings would have the genotype AA Bb Cc in F_2 generation of a trihybrid cross -
(1) 12.5% (2) 6.25%
(3) 25% (4) 37.5%
- Total number of genotypes and phenotypes in a dihybrid test cross is -
(1) 9 (2) 8
(3) 16 (4) 13
- In man brown eyes (B) are dominant to blue (b) and dark hairs (R) dominant to red hairs (r). A man with brown eyes and dark hairs marries a woman with blue eyes & dark hairs. They have one child with blue eyes and red hairs, what will be possible genotype of man, woman and child respectively?
(1) BBRR, bbRR, bbrr (2) BBrr, bbRr, bbrr
(3) BbRr, bbRr, bbrr (4) BbRR, bbRR, bbRr
- What is the frequency of pure round seeded pea plants in F_2 generation of a dihybrid cross -
(1) 4/16 (2) 6/16 (3) 1/16 (4) 2/16
- How many types of gametes are produced from individual of AABBCcDdee genotype
(1) 4 (2) 8 (3) 5 (4) 7
- How many kinds of gametes can be produced by an individual of genotype $\frac{A}{a} \frac{B}{b} \frac{C}{c} \frac{D}{d} \frac{e}{e} \frac{F}{f}$:-
(1) 32 (2) 16 (3) 8 (4) 4
- Proportion of progenies with round seed and red flowered pea plants if cross is made between WwRr and ww Rr would be -
(1) 3 / 8 (2) 1 / 8 (3) 4 / 8 (4) 2 / 8
- Ratio of dominant and recessive for both character plants in F_2 generation of dihybrid cross :-
(1) 1 : 1 (2) 5 : 3 (3) 9 : 1 (4) 3 : 1
- Which will not be the genotype of pollen grain of a plant with genotype HHbbDdnnMMaa :-
(1) HbdNMa (2) HbDnMa
(3) HbdnMa (4) All the above
- What is the probability of gamete AbC produced by a plant having genotype AaBbCc (If all the genes are situated on different chromosomes) ?
(1) $\frac{1}{2}$ (2) $\frac{1}{4}$
(3) $\frac{1}{6}$ (4) $\frac{1}{8}$

14. A plant has genotype TtRrGgPP. On selfing of this plant, what is the sum total of phenotypic categories ?
(1) 8 (2) 16 (3) 4 (4) 27
15. Location of a particular gene on sex chromosome or autosomes can be identified by -
(1) Test cross
(2) Out cross
(3) Back cross
(4) Reciprocal cross
16. In a dihybrid cross involving RRTT(red tall) $\times$ rrrt(white dwarf), what will be the ratio of red & tall plants in F_2 generation -
(1) 3 : 1 (2) 1 : 1
(3) 1 : 2 (4) 2 : 3
17. Offsprings of which cross will be phenotypically & genotypically similar -
(1) Dd $\times$ Dd (2) DD $\times$ dd
(3) DD $\times$ Dd (4) Ww $\times$ Ww
18. What will be the phenotypic ratio of offsprings of F_2 generation obtained by selfing of F_1 plant having AABbCC genotype
(1) 3 : 1
(2) 1 : 1
(3) 0 : 3 : 3 : 1
(4) 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1
19. Which of the following cross will produce 1 : 1 phenotypic ratio :-
(1) AaBb $\times$ aabb (2) AaBB $\times$ aaBB
(3) aabb $\times$ aabb (4) AABB $\times$ aabb
20. 81 genotypes in a hybrid selfing will produce how many phenotypes ?
(1) 81 (2) 16 (3) 8 (4) 32
21. What is the probability of obtaining pure homozygous individuals, if a cross is made between AaBbCcDd $\times$ aaBBCCdd individuals ?
(1) $\frac{2}{16}$ (2) $\frac{1}{16}$
(3) $\frac{16}{248}$ (4) $\frac{1}{64}$
22. Based on the observations in hybridisation experiment on garden pea plant, Mendel proposed that something was being stably passed down, unchanged, from parent to offspring through the gametes, over successive generations. He called these things as :-
(1) Genes (2) Factors
(3) Alleles (4) Multiple gene
23. A diploid organism is heterozygous for 3 loci, how many types of gametes can be produced?
(1) 16 (2) 64 (3) 27 (4) 8
24. A child has blood group O. If the father has blood group A and mother has blood group B then find out the incorrect statement :-
(1) Child is homozygous for blood group O
(2) Father is homozygous for blood group A
(3) Mother is heterozygous for blood group B
(4) (1) & (2) both
25. When pure green pod colour garden pea plant is crossed with yellow pod colour plant, then yellow pod colour plants obtained in F_2 generation will be :-
(1) 75% (2) 50% (3) 25% (4) 37.5%
26. What is correct about true-breeding pea line ?
(1) A true breeding line is one that, having undergone continuous self-pollination, shows the stable trait inheritance and expression for several generations.
(2) Mendel selected 14 true breeding pea plant varieties, as pairs which were similar except for one character with contrasting traits
(3) Mendel selected 7 true-breeding pea plant varieties, as pairs which were similar except for one character with contrasting traits
(4) (1) & (2) both
27. Which of the following law explains the proportion of 3 : 1 obtained at the F_2 in a monohybrid cross ?
(1) Law of dominance
(2) Theory of linkage
(3) Law of independent assortment
(4) (2) & (3) Both

28. In which case dominance is not an autonomous feature of a gene or the product that it has information for ?
(1) Multiple allele
(2) Multiple gene
(3) Polygenic inheritance
(4) More than one phenotype is influenced by the same gene
29. Which of the following provides a good example of multiple alleles ?
(1) ABO blood group
(2) Sickle-cell anaemia
(3) Flower colour in the dog flower plant
(4) Starch synthesis in garden pea seeds
30. Mendel crossed round and yellow seeded pea plant with wrinkled and green seeded plant, then in F_2 generation probability of plants having wrinkled seed would be :-
(1) $\frac{3}{16}$ (2) $\frac{1}{16}$ (3) $\frac{12}{16}$ (4) $\frac{4}{16}$
31. Which of the following statement can be explained on the basis of law of dominance ?
(1) characters are controlled by discrete units called factors
(2) Factors occur in pairs
(3) In a dissimilar pair of factors one member of the pair dominates the other
(4) All of the above

PRINCIPAL OF INHERITANCE # 02
(GENE INTERACTION TO CYTOPLASMIC INHERITANCE)

- Genes or alleles which can express independently when they are present together and also follow the law of segregation are -
 - (1) Multiple genes
 - (2) Codominant genes
 - (3) Epistatic genes
 - (4) Complementary genes
- Maximum height of a plant is 30ft. and minimum height is 10 ft. If plant height is controlled by 3 pairs of genes, then the height of plant with genotype AaBbCc will be -
 - (1) 13.2 ft.
 - (2) 23.2 ft.
 - (3) 16.6 ft.
 - (4) 19.9 ft.
- What percentage of pea seeds would have intermediate size of starch grains in F_2 generation?
 - (1) 0%
 - (2) 25%
 - (3) 50%
 - (4) 75%
- Select wrong statement with respect to multiple alleles -
 - (1) It can be detected only in a population.
 - (2) They are mutant forms of the same gene.
 - (3) Number of phenotypes in multiple alleles is calculated by formula $2n + 1$.
 - (4) They occupy same locus on homologous chromosomes.
- In co-dominance the genes of an allelomorphic pair express and follow law of
 - (1) Equally independent assortment
 - (2) Unequally, dominance
 - (3) Equally, segregation
 - (4) Equally, dominance
- In *Mirabilis jalapa*, the percentage of plants having pink and red flowers would be when pink flower plant is test crossed.
 - (1) 25% pink & 25% red
 - (2) 50% pink & 50% red
 - (3) 50% pink & 0% red
 - (4) 0% pink & 50% red
- Multiple alleles can be found only when a population is studied because -
 - (1) An individual has only two alleles.
 - (2) A single trait is controlled by more than two alleles.
 - (3) A single gene affects different characters.
 - (4) It has quantitative inheritance.
- What phenotypic ratio is obtained by selfing of a dihybrid, in which one genes is completely dominant and one gene is incompletely dominant ?
 - (1) 18 : 6 : 6 : 2 : 9 : 3 : 3 : 1 : 9 : 3 : 3 : 1
 - (2) 27 : 9 : 9 : 9 : 3 : 1 : 3 : 3
 - (3) 3 : 6 : 3 : 1 : 2 : 1
 - (4) 18 : 6 : 6 : 2 : 9 : 3 : 3 : 1 : 1 : 2 : 1
- If all the four children of a family will not have similar blood group, than what will be the blood group genotype of father & mother ?
 - (1) $I^A I^A$ and $I^B I^B$
 - (2) $I^A I^O$ and $I^B I^B$
 - (3) $I^A I^O$ and $I^B I^O$
 - (4) $I^A I^A$ and $I^B I^O$
- The ratio between carrier, disease free & diseased individual on marriage between two carriers of sickle cell anaemia will be -
 - (1) 0 : 2 : 1
 - (2) 0 : 1 : 1
 - (3) 1 : 2 : 1
 - (4) 2 : 1 : 1
- A monohybrid cross between two plants, one having 24 cm long internode and other having 12 cm long internode, produces F_1 hybrid, all having 18 cm long internodes. This is a case of
 - (1) Complete dominance
 - (2) Incomplete dominance
 - (3) Co-dominance
 - (4) Multiple allelism
- In a polygenic inheritance of skin colours controlled by two polygenes, how many phenotypes, mulattoes and total progenies are formed in F_2
 - (1) 3, 3, 16 respectively
 - (2) 5, 6, 16 respectively
 - (3) 7, 20, 64 respectively
 - (4) 7, 6, 16 respectively

13. What would be the phenotypic ratio in F_2 generation in a dihybrid cross if both the genes show lethality in homozygous dominant state -
 (1) 2 : 2 : 2 : 2 (2) 4 : 2 : 2 : 1
 (3) 6 : 3 : 2 : 1 (4) 9 : 3 : 3 : 1
14. How many genotype are produced in F_2 generation in a dihybrid cross if both genes are pleiotropic -
 (1) 3 (2) 4
 (3) 9 (4) Cannot be calculated
15. If a particular trait is controlled by 2 genes (polygenic), then calculate the total number of phenotype and genotypes in F_2 generation
 (1) 13 (2) 8 (3) 14 (4) 27
16. In Pea plant, when homozygous round seeded plant is crossed with homozygous wrinkled seeded plant, then the offsprings will be :-
 (1) 100 % with large starch grains
 (2) 75 % with medium sized starch grains
 (3) 25 % with small sized starch grains
 (4) 0 % with small sized starch grains

Tg: @Chalnaayaaar

PRINCIPAL OF INHERITANCE # 03
(CHROMOSOMAL THEORY OF INHERITANCE TO SEX DETERMINATION)

- What will be the nature of progenies when there is marriage between colourblind father's son and colourblind mother's daughter -
(1) 50% sons colour blind
(2) 50% daughters carriers
(3) 50% daughters normal
(4) All of these
- Red eyed female *Drosophila* is crossed with white eyed male. If this cross results in 50% progeny being red eyed, we can say that -
(1) Both parents were hemizygous
(2) Female parent was heterozygous
(3) Female parent was pure
(4) Both parents were pure
- In a linear chromosome, map distance between four loci are $ab = 12$, $bc = 4$, $ad = 2$, $ac = 8$. The distance between c and d will be -
(1) 10% (2) 6%
(3) 10% or 6% (4) 3% or 6%
- In a certain taxon of insects some have 17 chromosomes and the other have 18 chromosomes. The 17 and 18 chromosome bearing organisms are :-
(1) Male and females, respectively
(2) Females and males, respectively
(3) All males
(4) All females
- What will be the percentage inheritance of a disorder from an X-linked diseased father to his son.
(1) 0% (2) 25% (3) 50% (4) 100%
- A homozygous recessive with cd genes was crossed with dominant (+ +). If their hybrid is test crossed and the following results were obtained

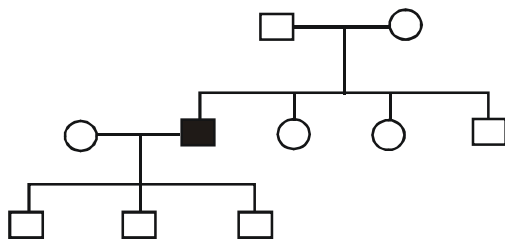
+	+	-	900
cd	-		880
+	d	-	115
+	c	-	105

than what will be the distance between genes c and d.
(1) 5.75 unit (2) 11 unit
(3) 44 unit (4) 90 unit
- Two genes a and b are linked and show 30% recombination. If ++ / ++ individual married with ab / ab then the types and proportion of gametes produced by F_1 will be -
(1) ++ 35% : ab : 35% : + a 15% : +b 15%
(2) ++ 15% : ab : 15% : + a 35% : +b 35%
(3) ++ 35% : ab : 15% : + a 35% : +b 15%
(4) ++ 15% : ab : 35% : + a 15% : +b 35%
- How many types of gametes are formed by a plant having AaBbCc genotype, in which A & B genes shows complete linkage ?
(1) 2 (2) 4 (3) 6 (4) 8
- Which of the following gametic combination will not form in plant having AaBbCc genotype, in which A & B genes show complete linkage & cis arrangement ?
(1) ABC (2) ABc (3) abC (4) aBC
- Which genotype ratio will appear by the trihybrid test cross in a completely linked plant :-
(1) 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1
(2) 1 : 1 : 1 : 1
(3) 1 : 1
(4) 1 : 2 : 1
- If father has pseudorickets and mother is normal then :-
(1) All offsprings will be affected
(2) Only male child will be affected
(3) Only female child will be affected
(4) One male and female child will be affected
- If both parent are bald and their first female child is normal, then the chances of baldness in their second male child is :-
(1) 50% (2) 100%
(3) 25% (4) 0%
- A dihybrid plant with genotype PpNn. It produces four types of gametes in following number
 $PN = 200$, $pn = 200$, $Pn = 800$, $pN = 800$
then what is the distance between linked genes?
(1) 30 cM (2) 10 cM
(3) 25 cM (4) 20 cM

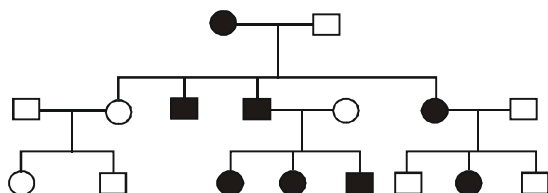
14. Find out the % of plants, which are dominant for both the character by the cross of $\frac{++}{ab}$ with its recessive form, if 20% recombination is present:-
 (1) 10% (2) 20% (3) 45% (4) 40%
15. Four genes A, B, C and D located on chromosome and cross over frequencies between different genes are :
 $A - D \Rightarrow 20\%$, $A - C \Rightarrow 4\%$
 $C - D \Rightarrow 16\%$, $B - C = 9\%$
 $A - B = 5\%$
 based on above data, what is the arrangement of linked genes on chromosome
 (1) A - B - C - D (2) B A C D
 (3) C B A D (4) C A B D
16. A woman of normal vision whose father was colourblind, marries a man of normal vision, whose father was also colourblind. The sons of this marriage would be :-
 (1) All normal (2) All colourblind
 (3) 50% colourblind (4) 100% colourblind
17. If a colourblind female marries a normal male (XY) then :-
 (1) All the sons are normal
 (2) All the sons are colourblind
 (3) All the daughter are colourblind
 (4) Both sons and daughters are colourblind
18. By the cross of F_1 linked dihybrid plant with a plant of genotype aabb, we get the 1300 plants out of 2000 of parental type. The distance between A and B gene is :-
 (1) 35 map unit (2) 15 map unit
 (3) 65 map unit (4) 65 kello meter
19. Genotype of plant is $\frac{++}{ab}$ and there is 18% recombination present in it then percentage of gametes will be :-
 (1) $++ = 9\%$ (2) $ab = 18\%$
 (3) $+b = 9\%$ (4) $a+ = 41\%$

PRINCIPAL OF INHERITANCE # 04
(HUMAN GENETICS TO POPULATION GENETICS)

- Find out the number of dominant individual in a population of 6000, if the frequency of recessive phenotype is 25%
(1) 3000 (2) 4500 (3) 1500 (4) 2000
- The frequency of an autosomal recessive Allele is 0.4. Then what will be the frequency of heterozygotes in progeny among 4000 individual ?
(1) 2000 (2) 1920 (3) 2400 (4) 1600
- In this given pedigree what will be the nature of inheritance :



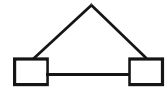
- (1) X-linked dominant
(2) Y-linked
(3) Autosomal dominant
(4) Autosomal recessive
- Pedigree analysis is useful in human genetics because :
(1) It can trace the inheritance of a particular trait
(2) Control crosses can not be performed in human beings
(3) It helps to trace disease in a family
(4) All of these
- In the given pedigree, find out the shaded symbols indicate whether the trait is dominant or recessive :



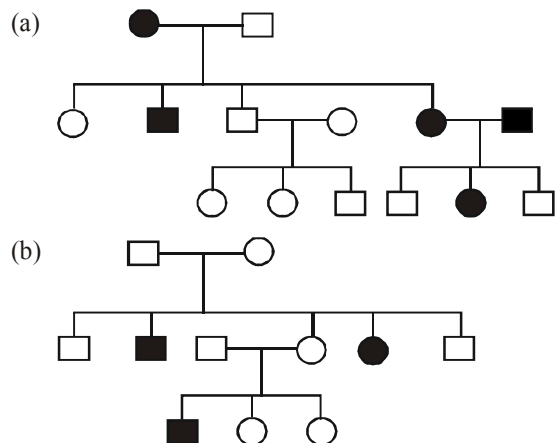
- (1) Dominant
(2) Recessive
(3) Co-dominant
(4) May be dominant or recessive

- Find out the number of heterozygous free ear lobed persons in a population of 3000 if the proportion of fused ear lobed persons is 9%:
(1) 1260 (2) 1470
(3) 270 (4) 2730

- In pedigree analysis the symbol represents :-

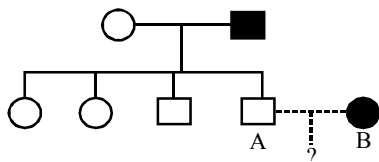


- (1) Consanguineous marriage
(2) Sex unspecified
(3) Monozygotic twin
(4) Dizygotic twin
- If in a population, frequency of organisms of recessive trait is 25% then calculate the frequency of recessive allele :
(1) 25% (2) 50% (3) 75% (4) 5%
- If the frequency of recessive phenotype is 9% then find out the number of homozygous organisms in population of 50,000 individuals:-
(1) 42,000 (2) 29,000 (3) 4500 (4) 24,500
- Given pedigree (a) & (b) shows the inheritance of a particular genetical disorder. Choose the correct combination.



- (1) a – Sickle cell Anaemia,
b – Myotonic dystrophy
(2) a – Myotonic dystrophy,
b – Sickle cell Anaemia
(3) a – Pseudoricketes,
b – Colourblindness
(4) a – Colourblindness,
b – Pseudoricketes

11. In the pedigree shown below, individuals with the solid symbols suffers from albinism. You would counsel the couple A & B that the probability that each of their child will have the disease is :-



(1) 0% (2) 25% (3) 50% (4) 75%

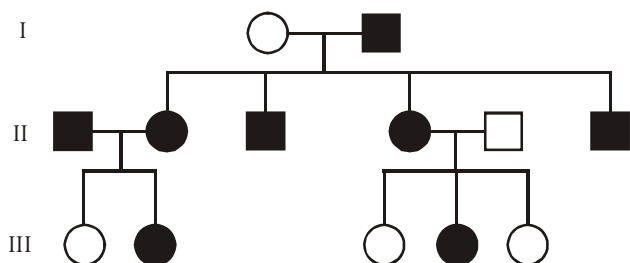
12. Organisms in which the total number of chromosomes are same in both male and female, But two different types of gametes in terms of the sex chromosomes, are produced by female are :-

(1) Human
(2) Grasshopper
(3) Birds
(4) Drosophila

13. Dihybrid cross conducted by Morgan in which yellow body and white eyed female *Drosophila* is crossed with wild type male then non-parental combinations obtain in F_2 -generation were :-

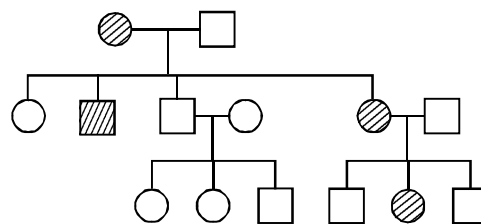
(1) 98.7% (2) 37.2%
(3) 62.8% (4) 1.3%

14. Study the given pedigree carefully, the trait indicated is :-



(1) Autosomal recessive
(2) X-linked recessive
(3) Autosomal dominant
(4) Maternal imprinting

15. Given pedigree show inheritance of autosomal dominant disorder (myotonic dystrophy) then what will be genotype of shaded symbol :-

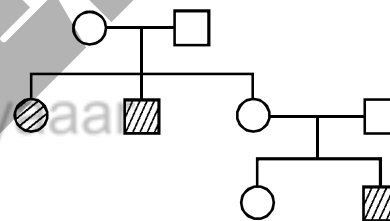


(1) AA (2) Aa
(3) AA or Aa (4) aa

16. The map distance between A and C = 30 cM, B and C = 20 cM, A and B is 50 cM, B and D = 10 cM, C and D = 30 cM. What is the arrangement of ABCD gene on chromosome

(1) ABCD (2) DBCA
(3) BACD (4) CABD

17. Predict from the following chart :-



(1) Character is x-linked dominant
(2) Character is x-linked recessive
(3) Character is Autosomal dominant
(4) Character is Autosomal recessive

18. Thalassemia is differ from sickle cell anaemia because :-

(1) Thalassemia is a qualitative disease
(2) Thalassemia is a quantitative disease
(3) Thalassemia is an autosomal dominant disease
(4) Thalassemia is a chromosomal disorder

19. A normal woman has a haemophilic son besides three perfectly normal daughters. The genotypes of the woman and her husband with respect to haemophilia would respectively be:-

(1) X^+X^+ and X^{hy}
(2) X^hX^+ and X^{hy}
(3) X^hX^h and X^+y
(4) X^hX^+ and X^+y

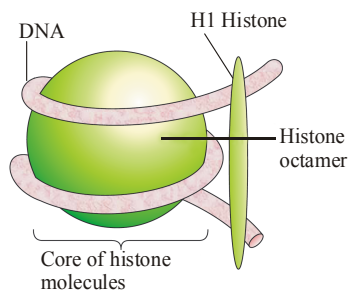
20. A trait controlled by genes at several loci is an example of
(1) Multiple allelism
(2) Incomplete dominance
(3) Pleiotropy
(4) Polygenic inheritance
21. A husband and wife have normal vision but fathers of both of them were colour blind. Probability of their first daughter to be colour blind is
(1) 25% (2) 50%
(3) 75% (4) 0%
22. A dihybrid cross produces 6 phenotype in F_2 generation then which statement is correct :-
(1) Both genes show dominance
(2) Both genes show incomplete dominance
(3) One show dominance and another show incomplete dominance
(4) Both genes show codominance

Tg: @Chalnaayaaar

**MOLECULAR BASIS OF INHERITANCE # 01
(NUCLEIC ACIDS TO MECHANISM OF DNA REPLICATION)**

- A DNA molecule in which both strands have radioactive thymidine is allowed to duplicate in an environment containing non-radioactive thymidine. What will be the exact number of DNA molecules that contain some radioactive thymidine after 3 duplication ?
(1) One (2) Two
(3) Four (4) Eight
- Enzyme, that is not participates in the process of DNA-replication in prokaryotes :-
(1) DNA ligase
(2) DNA topoisomerase
(3) Reverse transcriptase
(4) DNA polymerase
- Which of the following is not a characteristic feature of genetic material ?
(a) It should be chemically and structurally less stable
(b) It should be able to produce its replica
(c) It should be more reactive
(d) It does not follow Mendelian inheritance
(e) It provides scope for slow changes i.e. mutation
(1) only a, b, c and d
(2) b, c, a, d, e
(3) c, d, e
(4) a, c, d
- Viruses having RNA genome evolve faster, because :-
(1) RNA is comparatively unstable, so mutate at a faster rate
(2) RNA is stable, and mutate at a slow rate
(3) RNA is chemically less reactive
(4) RNA is double stranded
- DNA is better genetic material than RNA, because:-
(1) DNA is chemically less reactive and structurally more stable as compared to RNA
(2) Presence of thymine at the place of uracil provides additional stability to DNA
(3) DNA being stable, so mutate at a slow rate
(4) All the above
- Consider the following four statements A, B, C and D and select the right option for two correct statement :-
Statements :-
(A) RNA was first genetic material
(B) 5-methyl uracil is found in RNA
(C) DNA polymerase-III does not require RNA primer for the synthesis of DNA strand
(D) RNA primer is formed during the process of DNA replication
The correct statements are :-
(1) (A) and (B)
(2) (B) and (C)
(3) (A) and (D)
(4) (A) and (C)
- If *E.coli* containing N^{15} - N^{15} DNA was allowed to grow for 80 minutes in medium containing N^{14} then, what would be the percentage of light density and hybrid density DNA molecule ?
(1) 87.5% light density ; 12.5% hybrid density
(2) 75% light density ; 25% hybrid density
(3) 25% light density ; 75% hybrid density
(4) 12.5% light density ; 87.5% hybrid density
- Which is not found in DNA ?
(1) Deoxy ribose sugar (2) 5-methyl uracil
(3) Demethylated thymine (4) H_3PO_4
- Viruses having RNA genome evolve faster, because :-
(1) RNA is unstable and mutate at a faster rate
(2) RNA is more stable
(3) RNA is first genetic material
(4) RNA is the main genetic material
- A segment of DNA molecule contains 20,000 base pairs. What is the number of phosphate molecule in this DNA molecule ?
(1) 20,000 (2) 40,000
(3) 10,000 (4) 5,000
- In a segment of DNA molecule there occurs 200 molecules of adenine nitrogen bases and 200 molecules of cytosine nitrogen bases. What will be the total number of purine nitrogen bases in this segment ?
(1) 800 (2) 400
(3) 100 (4) 200

12.

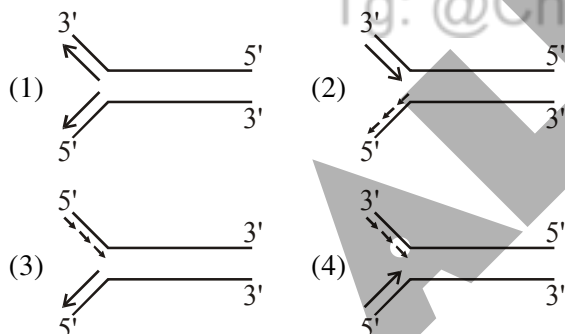


- (A) Histone octamer is made up of 5 types of Histone protein
 (B) A typical nucleosome contains 200 bp of DNA Helix
 (C) Histones are organised to form a unit of eight molecules called as histone octamer
 (D) The negatively charged DNA is wrapped around the positively charged histone octamer to form a structure called nucleosome.

How many statements are correct ?

- (1) One (2) Two
 (3) Three (4) Four

13. Which one is true among the following for DNA replication :-



14. In a phosphodiester bond formation a phosphate group is bonded with

- (1) 5'-OH of one sugar and 2'-OH of next sugar
 (2) 3'-OH of one sugar and 5'-OH of next sugar
 (3) 3'-OH of one sugar and 2'-OH of next sugar
 (4) 5'-OH of one sugar and 1'-OH of next sugar

15. Which of the following enzyme inhibit transformation of R-strain bacteria to S-strain:-

- (1) DNAs (2) RNase
 (3) DNase (4) Both (1) and (3)

16. Okazaki fragments are :-

- (1) Segments of DNA capable of translation
 (2) Segments of DNA which undergo recombination
 (3) Segments of chain of nucleotides formed during transcription
 (4) Segments of chain of nucleotides formed during replication of DNA

17. In a ds DNA if the sequence of N-Bases in one strand is known then the sequence in other strand can be predicted, this is because of :-

- (1) Antiparallel nature
 (2) Purine-purine pairing
 (3) Pyrimidine-pyrimidine pairing
 (4) Complementary nature

18. A molecular biologist analysed a nucleic acid sample and found that it contained the N₂ bases in following proportion A = 20%, T = 15%, C = 35%, G = 30%. This data indicates that -

- (1) Nucleic acid in the sample is single stranded DNA
 (2) Nucleic acid in the sample is double stranded DNA
 (3) Nucleic acid in the sample is double stranded RNA
 (4) Nucleic acid in the sample is single stranded RNA

19. Which one is incorrect statement about genetic material ?

- (1) It should be able to express itself in the form of "Mendelian characters".
 (2) DNA chemically less reactive and structurally more stable than RNA
 (3) RNA can directly code for the synthesis of proteins
 (4) Only DNA is able to mutate.

20. If E coli with heavy DNA is allowed to grow for 80 minutes in ¹⁴NH₄Cl medium then what would be the proportion of hybrid and light density DNA molecules respectively :-

- (1) 7 : 1 (2) 1 : 7
 (3) 2 : 0 (4) 0 : 2

**MOLECULAR BASIS OF INHERITANCE # 02
(RIBO NUCLEIC ACID TO TRANSLATION)**

1. The following features occur during protein synthesis:
 - (i) Movement of m-RNA from the nucleus into the cytoplasm, where it binds to the ribosomes
 - (ii) Formation of amino acyl t-RNA complex
 - (iii) Transcription of specific segments of DNA into m-RNA molecules in the nucleus
 - (iv) Binding of N-terminal amino acid, methionine t-RNA to the 'P' site of the ribosome. The t-RNA anticodon "pairs with AUG on m-RNA"
 - (v) Formation of peptide bond between first and second amino acids at the 'A' site
 - (vi) Release of the completed polypeptide chain from ribosomes
 - (vii) Migration of dipeptide to form a tripeptide and then a polypeptide

The correct order of events is

 - (1) (iii) – (ii) – (i) – (iv) – (v) – (vi) – (vii)
 - (2) (i) – (ii) – (iii) – (iv) – (v) – (vi) – (vii)
 - (3) (iii) – (i) – (ii) – (iv) – (v) – (vi) – (vii)
 - (4) (iii) – (i) – (ii) – (iv) – (v) – (vii) – (vi)
2. TMV infects a variety of plants, including *Zinnia* and *tobacco*. When TMV-RNA is used for infection, the amino acid sequence of the coat protein of the progeny is the same whether the host is *Zinnia* or *tobacco*. This proves that the genetic code is :-
 - (1) degenerate
 - (2) universal
 - (3) unidirectional
 - (4) non-overlapping
3. Transfer RNA :-
 - (1) forms hydrogen bonds between its codon and the anticodon of an m-RNA in the 'A' site of a ribosome
 - (2) binds specific amino acid by the help of aminoacyl t-RNA synthetase
 - (3) uses GTP as the energy source to bind its amino acid
 - (4) is translated from m-RNA
4. Several proteins may be produced at the same time from a single m-RNA by :-
 - (1) the action of several ribosomes in a string called a polyribosome
 - (2) several RNA polymerase molecules working sequentially
 - (3) single peptides that associate ribosomes with rough E.R.
 - (4) the involvement of multiple spliceosomes complex
5. Which of the following is true for RNA processing ?
 - (1) Exons are excised before the m-RNA processing
 - (2) Assemblies of protein and snRNPs, called spliceosomes, may catalyze splicing
 - (3) The RNA transcript that leaves the nucleus may be much longer than the original transcript
 - (4) Large quantities of r-RNA are assembled into ribosomes
6. All of the following would be found in a prokaryotic cell except :-
 - (1) m-RNA
 - (2) r-RNA
 - (3) simultaneous transcription and translation
 - (4) sn-RNA
7. A functional unit of gene which specifies the synthesis of one polypeptide is known as :-
 - (1) recon
 - (2) clone
 - (3) codon
 - (4) cistron
8. A DNA strand is directly involved in the synthesis of all the following except :
 - (1) t-RNA molecule
 - (2) m-RNA molecule
 - (3) another DNA strand
 - (4) protein synthesis
9. Because most of the amino acids are represented by more than one codons, the genetic code is said to be :-
 - (1) deaminated
 - (2) comma less
 - (3) degenerate
 - (4) overlapping
10. Which of the following RNA has structural and catalytic role in translation ?
 - (1) m-RNA
 - (2) t-RNA
 - (3) r-RNA
 - (4) g-RNA

11. Match the column-I with column-II and select the correct answer :-

Column-I		Column-II	
(A)	Replication	(i)	RNA → DNA
(B)	Transcription	(ii)	m-RNA → protein
(C)	Translation	(iii)	DNA → mRNA
(D)	Reverse transcription	(iv)	DNA → DNA
(E)	Ribosome	(v)	r-RNA + protein

- (1) A – i, B – ii, C – iii, D – iv, E – v
 (2) A – ii, B – i, C – iii, D – iv, E – v
 (3) A – iii, B – iv, C – ii, D – i, E – v
 (4) A – iv, B – iii, C – ii, D – i, E – v
12. The same amino acid sequence of a polypeptide chain can be represented by more than one type of nucleotide sequence in mRNA. It explains which property of genetic code?
- (1) Universal nature
 (2) Degeneracy
 (3) Un-ambiguous
 (4) Comma-less or continuous
13. The process of translation requires the transfer of genetic information from :-
- (1) A polymer of amino acids to a polymer of carbohydrates.
 (2) A polymer of deoxy nucleotides to a polymer of nucleotides.
 (3) A polymer of nucleotides to a polymer of amino acids.
 (4) A polymer of amino acids to proteins.
14. Which of the following region of transcription unit is located towards 3' end of the coding strand and it usually defines the end of the process of transcription ?
- (1) Promoter (2) Structural genes
 (3) Terminator (4) Coding strand

15.  P = Promoter
T = Terminator

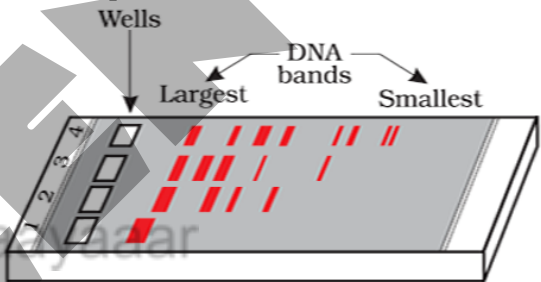
The m-RNA produced by transcribption of above given DNA is :-

- (1) 5' AUGCU 3'
 (2) 5' AGCAU 3'
 (3) 3' UCGUA 5'
 (4) 5' UACGA 3'
16. Which statement is true for transcription?
- (1) Both strands of DNA are copied during transcription
 (2) The total DNA of an organism gets transcribes
 (3) Only a segment of DNA and only one of the strands is copied into RNA
 (4) RNA dependent DNA polymerase enzyme catalyses process of transcription
17. Which of the following codon has dual functions ?
- (1) UUU (2) UGA
 (3) AUG (4) UGG
18. Which of the following RNA act as enzyme for the formation of peptide bond in bacteria :-
- (1) 28s rRNA (2) 23s rRNA
 (3) 16s rRNA (4) 18s rRNA
19. Which of the following enzyme is helpful in polymerising RNA with defined sequences in a template independent manner?
- (1) Severo ochoa enzyme
 (2) Polynucleotide phosphorylase
 (3) DNA dependent RNA polymerase
 (4) Both (1) and (2)

**MOLECULAR BASIS OF INHERITANCE # 03
(REGULATION OF GENE EXPRESSION TO HUMAN GENOME PROJECT)**

- Which of the following statement is **incorrect** with respect to Lac operon ?
 - (1) Single promoter for three structural genes, lac z, lac y, lac a
 - (2) Polycistronic m-RNA formation
 - (3) Glucose results in induction of *Lac* operon
 - (4) Repressor protein shows negative control
- In structure of normal DNA, replacement of one nitrogenous base by another nitrogenous base is called as 'A' and replacement of adenine by guanine is called as 'B'. In the above statement A & B here refers to :-
 - (1) A → Substitution B → Transition
 - (2) A → Point mutation B → Transversion
 - (3) A → Frame shift mutation B → Transversion
 - (4) Both (2) and (3)
- In the octaploid wheat, the haploid(n) and basic numbers(X) of chromosomes are :-
 - (1) n = 21, X = 7 (2) n = 7, X = 21
 - (3) n = 28, X = 7 (4) n = 7, X = 28
- A classical example of point mutation is a change of single base pair in the gene for beta globin chain that results in the change of amino acid residue glutamate to valine. It result into a diseased condition called as :-
 - (1) Sick cell anemia (2) Phenylketonuria
 - (3) Haemophila (4) Thalassemia
- Select the **incorrect** statement for RFLP :-
 - (1) It is the basis of DNA fingerprinting
 - (2) It is due to variable length of restricted fragment.
 - (3) It is due to variable number of minisatellite.
 - (4) It is same for all human beings.
- Any Allelic sequence variation has traditionally been described as DNA polymorphism if more than one allele at a locus show : -
 - (1) Frequency greater than 0.01
 - (2) Frequency less than 0.01
 - (3) Frequency greater than 1.0
 - (4) Frequency less than 0.01%
- Find an incorrect statement with respect to results of HGP :-
 - (1) Dystrophin protein gene, is the largest gene of human genome.
 - (2) Chromosome Y has minimum 231 genes
 - (3) SNPs are identified at about 2.4 million locations.
 - (4) The functions are unknown for over 50% of discovered genes.
- If there are four different types of nitrogenous bases (A, T, G and C) then how many different types of transitions and transversions are possible?
 - (1) Transition = 8, Transversion = 4
 - (2) Transition = 4, Transversion = 4
 - (3) Transition = 8, Transversion = 8
 - (4) Transition = 4, Transversion = 8
- Choose the incorrect match w.r.t. HGP :
 - (1) Expressed Sequence Tags - Identifying all the genes that are expressed as RNA
 - (2) Sequence Annotation - Sequencing both coding and non-coding sequences then assigning different regions with functions
 - (3) YAC and BAC - Cloning vectors
 - (4) Human chromosome number 22 - The last chromosome to be sequenced
- Which one is correct for variable number tandem repeat (VNTR) :
 - (1) Is a location in a genome where nucleotide sequence is organised as tandem repeat
 - (2) The number of repeat varies from chromosome to chromosome in an individual and also between individuals
 - (3) Its size varies from 0.1 to 20 kbp
 - (4) All are correct

BIOTECHNOLOGY : PRINCIPLES AND PROCESSES

- Which is not true about PCR (Polymerase Chain Reaction) ?
 - (1) PCR can amplify very small amount of DNA
 - (2) It can be used to detect HIV in suspects
 - (3) Only RNA can be used as primer
 - (4) Used to detect mutation in genes
- In agarose gel electrophoresis–
 - (1) DNA migrates towards negative electrode
 - (2) Larger molecules migrate faster than smaller molecules
 - (3) Ethidium bromide can be used to visualize the DNA fragments.
 - (4) Pink coloured bands of DNA can be visualized when gel exposed to UV light
- Which of the following vector is used extensively for genetic engineering in animals?
 - (1) *E.coli*
 - (2) Ti plasmid
 - (3) *Bacillus thuriengenensis*
 - (4) Retrovirus (disarmed)
- A good cloning vector should have all except :-
 - (1) Origin of replication to start replication
 - (2) Many recognition sites for single restriction enzyme
 - (3) High copy number
 - (4) Selectable marker
- If a recombinant DNA bearing gene for tetracyclin resistance is transferred into *E.coli* cells and the host cells are spread on agar plates containing tetracyclin then :-
 - (1) Both transformed and non-transformed recipient cells will die
 - (2) Both transformed and non transformed cells will grow
 - (3) Transformed recipient cells will die and non transformed recipient cells will grow
 - (4) Transformed recipient cells will grow and non-transformed recipient cells will die
- Which one of the following is not required in PCR?
 - (1) Oligonucleotide primers
 - (2) Helicase enzyme
 - (3) DNA template
 - (4) Taq polymerase
- After the formation of products in the bioreactors, it undergoes through a series of processes before it is ready for marketing as a finished product, is called ?
 - (1) Upstream processing
 - (2) Downstream processing
 - (3) Elution
 - (4) Transformation
- Given below is a typical agarose gel in which electrophoresis had occurred.
 
 - (1) Lane - 1 shows migration of digested DNA fragments
 - (2) Only Lane - 4 shows migration of digested DNA fragments
 - (3) Lane - 2 to 4 shows migration of digested set of DNA fragments
 - (4) Wells are always placed towards positive electrode during electrophoresis
- A direct method of gene transfer which is suitable for plants, in this cells are bombarded with high velocity micro-particles of gold or tungsten coated with DNA is ?
 - (1) Micro-injection
 - (2) Biolistics or Gene gun
 - (3) Disarmed pathogen
 - (4) Electroporation
- Which of the following is not applicable to *Agrobacterium tumefaciens*?
 - (1) Pathogen of several dicot plants
 - (2) Has ability to transform mutant species
 - (3) Delivers gene of our interest
 - (4) Ti plasmid of it is always pathogenic to plants without any exception

BIOTECHNOLOGY : APPLICATION

- Which one is incorrectly matched ?
 (1) Golden rice - Rich in vitamin A
 (2) 'Flavr savr' tomato - Polygalacturonase
 (3) Brassica napus - Hirudin
 (4) *Meloidegyne incognitia* - Bt proteins
- GM plants, whose genes have been altered by manipulation, are useful in many ways. Match column-I (Genetic modification) to column-II (example) and choose the correct option.

Column I		Column II	
I	Reduce reliance on chemical pesticides	i	Salt tolerant transgenic tomato
II	Enhanced nutritional value of food	ii	Flavr-Savr tomato
III	Reduce post harvest losses.	iii	Nematode resistant tobacco
IV	Tolerant to abiotic stresses	iv	Golden rice

- (1) I-iii, II-iv, III-i, IV-ii
 (2) I-ii, II-iv, III-iii, IV-i
 (3) I-ii, II-iv, III-i, IV-iii
 (4) I-iii, II-iv, III-ii, IV-i
- Why insulin is not administered orally to diabetic patient ?
 (1) It is bitter in taste
 (2) It is peptide and can be digested
 (3) It will lead to sudden decrease in blood sugar if given orally
 (4) It leads to peptic ulcer if given orally
- In which of the following genetically modified organism polygalacturonase gene is silenced ?
 (1) Golden rice (2) Bt-cotton
 (3) Flavr-savr tomato (4) Bt-corn

- Actually, the Bt toxin protein exist as inactive protoxins but once an insect ingest the inactive toxin, it is converted into an active form of toxin due to the :-
 (1) Acidic pH of the gut
 (2) Alkaline pH of the gut
 (3) Neutral pH of the gut
 (4) Either acidic or alkaline pH of the gut
- As most Bt toxins are insect group specific, so the choice of Bt genes depends upon :-
 (1) crop (2) targeted pest
 (3) only crop (4) (1) and (2) both
- In human insulin is synthesised as a prohormone, which contains an extra stretch called :-
 (1) A-peptide (2) C-peptide
 (3) B-peptide (4) α -peptide
- The techniques that serve the purpose of early diagnosis :-
 (1) Polymerase chain Reaction
 (2) ELISA
 (3) Recombinant DNA technology
 (4) All of the above
- The Indian parliament has recently cleared the ____ amendment of the Indian patents Bill that takes such issues into consideration, including patent terms emergency provisions and research and development initiative :-
 (1) First (2) Third
 (3) Second (4) Fifth
- At present about How many recombinant therapeutics have been approved for human use the world over :-
 (1) 12 (2) 30 (3) 27 (4) 40

MICROBES IN HUMAN WELFARE

- Which product are synthesized from microbes?
(A) Antibiotics and bread
(B) Fermented beverages and citric acid
(C) Enzymes and acetic acid
(D) Bioactive molecules and curd
(1) A, C, D
(2) A, B, C, D
(3) A, C
(4) A, B, C
- Which one of the following is not a biopesticide?
(1) *Bacillus thuringiensis*
(2) Nucleopolyhedro virus
(3) Trichoderma
(4) Agrobacterium
- Biogas is the mixture of gases produced by the microbial activity. The type of the gas produced depends upon :-
(1) Type of microbes
(2) Type of organic substrate/waste
(3) Size of digester
(4) Both (1) and (2)
- Which of the following bioactive molecule has been commercialised as blood cholesterol lowering agent ?
(1) Cyclosporin-A
(2) Streptokinase
(3) Statin
(4) All of the above
- Which of the following alcoholic drinks are produced by distillation of the fermented broth?
(1) Wine
(2) Whisky
(3) Rum
(4) (2) & (3) Both
- Biogas is a mixture of gases produces by the microbial activity in which predominant gas is:-
(1) CO₂
(2) CO
(3) Methane
(4) H₂
- Identify the correct match from the Column-I and Column-II :-

	Column-I		Column-II
a	<i>Aspergillus niger</i>	i	Butyric acid
b	<i>Acetobacter aceti</i>	ii	Citric acid
c	<i>Clostridium butylicum</i>	iii	Lactic acid
d	<i>Lactobacillus</i>	iv	Acetic acid

(1) a-ii, b-iv, c-i, d-iii
(2) a-iii, b-iv, c-i, d-ii
(3) a-ii, b-i, c-iv, d-iii
(4) a-iv, b-ii, c-i, d-iii
- The dough, which is used for making bread is fermented using :-
(1) *saccharomyces cerevisiae*
(2) *propionibacterium sharmanii*
(3) *acetobacter aceti*
(4) *streptococcus*
- Enzyme which is produced by the bacterium *streptococcus* and modified by genetic engineering is used as a "clot buster" for removing clots from the blood vessels of patients who have undergone myocardial infarction leading to heart attack is :-
(1) Pectinases
(2) Streptokinase
(3) Polygalacturonase
(4) Adenosine deaminase
- Which of the following organism serve as an important biofertiliser in paddy fields ?
(1) Fungi
(2) Cyanobacteria
(3) Trichoderma
(4) Ladybird

**STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION
(PLANT BREEDING)**

1. Match the column-I with column-II :-

	Column-I		Column-II
(a)	Atlas 66	(i)	Mustard
(b)	Pusa gaurav	(ii)	Flat bean
(c)	Pusa sawani	(iii)	Wheat
(d)	Pusa sem 3	(iv)	Bhindi

- (1) a(i), b(ii), c(iv), d(ii)
 (2) a(iii), b(i), c(ii), d(iv)
 (3) a(iii), b(i), c(iv), d(ii)
 (4) a(iv), b(ii), c(iii), d(i)

2. Identify the mismatched pair :-

	Variety	Diseases/Insect pests (resistant to)
(1)	Pusa komal	Bacteria Blight
(2)	Pusa sawani	Shoot and fruit borer
(3)	Pusa sadabahar	Black rot
(4)	Himgiri	Leaf and stripe rust

3. Somatic hybrids are produced by:-

- (1) Fusion of two germ cells
 (2) Fusion of two complete somatic plant cell
 (3) Fusion of isolated naked protoplast
 (4) Fusion of two hybrid protoplast with cell wall

4. The entire collection of plants / seeds having all the diverse alleles for all genes in a given crop is called :-

- (1) hybrid vigour
 (2) Germplasm conservation
 (3) somaclonal variation
 (4) germplasm collection

5. Resistance to yellow mosaic virus in bhindi (*Abelmoschus esculentus*) was transferred from a wild species and resulted in a new variety of *Abelmoschus esculentus* called :-

- (1) Pusa swarnim (2) Parbhani kranti
 (3) Pusa komal (4) Pusa sem 3

6. In plant tissue culture medium, which one of the following is generally provide as a carbon source ?

- (1) sucrose (2) auxin
 (3) cytokinins (4) Inorganic salt

7. The Indian agricultural research institute, New Delhi has released several vegetable crops that are rich in vitamin-A, are :-

- (1) Carrots (2) Pumpkin
 (3) Spinach (4) All of the above

8. Micro-organism which has high rate of biomass production and growth, can be expected to produce 25 tonnes of protein is :-

- (1) Spirulina
 (2) *Methylophilus methylotrophus*
 (3) *Pseudomonas putida*
 (4) *E.coli*

9. Which of the following step is crucial to the success of the breeding objective and requires careful scientific evaluation of the progeny, in breeding a new genetic variety of a crop ?

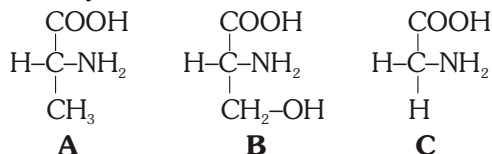
- (1) collection of variability
 (2) evaluation and selection of parents
 (3) selection and testing of superior recombinants
 (4) Testing, release and commercialisation of new cultivars

10. In 1963 high yielding and disease resistant varieties of wheat were introduced all over the wheat growing belt of India, were :-

- (1) Jaya and Ratna
 (2) Sonalika and kalyan sona
 (3) IR – 8 and Taichung native - 1
 (4) Sharbati sonora and Pusa lerma

BIOMOLECULE - I (PROTOPLASM)

1. Identify the amino acids marked as A, B & C:



- (1) A = Alanine, B = Serine, C = Glycine
(2) A = Glycine, B = Serine, C = Arginine
(3) A = Glutamic acid, B = Serine, C = Alanine
(4) A = Glycine, B = Serine, C = Alanine
2. Arachidonic acid has a carboxyl group attached to an R group. This R group contain:-
(1) 16 carbons (2) 15 carbons
(3) 20 carbons (4) 19 carbons
3. In primary structure a protein is imagined as a line, the left end represent by :-
(1) The first amino acid and its carboxyl terminal
(2) The last amino acid and its carboxyl terminal
(3) The first amino acid and its amino terminal
(4) The last amino acid and its amino terminal
4. Read the following statements and find out the incorrect statement.
(1) Oil have lower melting point (e.g. gingely oil) and hence remain as oil in winters
(2) Adenosine, guanosine, cytosine, uridine and thymidine are nucleosides
(3) Adenylic acid, thymidylic acid, guanylic acid uridylic acid and cytidylic acid are nucleotides
(4) Nucleic acids like DNA and RNA consists of nucleotides only
5. Polymeric polysaccharide consisting of only one type of monosaccharide is :-
(1) Glycogen (2) Cellulose
(3) Inulin (4) All of the above
6. Exoskeleton of arthropods have a complex polysaccharide called chitin, which is consist of only one type of amino sugar that is :-
(1) N-acetyl-galactosamine
(2) N-acetyl-glucosamine
(3) β -fructose
(4) β -glucose

7. Which of the following organic compounds are present in acid insoluble fraction but are not strictly biomacromolecules ?
(1) Nucleic acids (2) Polysaccharides
(3) Proteins (4) Lipids

8. Correctly Match the column-I with column-II

Column-I		Column-II	
(i)	Drugs	(a)	Gums, cellulose
(ii)	Polymeric substances	(b)	Morphine, codeine
(iii)	Alkaloids	(c)	Carotenoids, Anthocyanins
(iv)	Pigments	(d)	Vinblastin, curcumin

- (1) i-c, ii-a, iii-b, iv-d
(2) i-d, ii-b, iii-a, iv-c
(3) i-d, ii-a, iii-b, iv-c
(4) i-a, ii-d, iii-b, iv-c
9. Which of the following statement is not correct ?
(1) There is no uncatalysed metabolic conversion in living systems
(2) The living state is a equilibrium steady state to be able to perform work
(3) The living state and metabolism are synonymous
(4) The catalysts which hasten the rate of a given metabolic conversation are also proteins and these proteins with catalytic power are named enzymes
10. Correctly match the column-I with column-II

Column-I (Component)		Column-II (% of the total cellular mass)	
(i)	Proteins	(a)	5-7%
(ii)	Carbohydrates	(b)	2%
(iii)	Nucleic acids	(c)	3%
(iv)	Lipids	(d)	10-15%

- (1) i-d, ii-c, iii-a, iv-b (2) i-c, ii-d, iii-a, iv-b
(3) i-b, ii-c, iii-a, iv-d (4) i-d, ii-a, iii-c, iv-b

HUMAN HEALTH AND DISEASE # 01

- Which of the following is not a component of innate immunity ?
 (1) Interferons
 (2) Phagocytes
 (3) Skin
 (4) Antibodies
- Which of the following cells are not included in cellular barrier of innate immunity ?
 (1) Neutrophils
 (2) Helper T cells
 (3) NK cells
 (4) Macrophages
- Who disproved "Good humor hypothesis" ?
 (1) Hippocrates
 (2) Bowditch
 (3) William Harvey
 (4) Metchnikoff
- Virus infected cells secrete proteins called as interferons which protect non-infected cells from viral infection. They are a part of :-
 (1) Physical barriers
 (2) Physiological barriers
 (3) Cellular barriers
 (4) Cytokine barriers
- In which one of the following options examples are incorrectly matched with their particular type of immunity ?

Examples	Type of immunity
(1) Saliva in mouth and tears in eyes	– Physiological barrier
(2) Skin, HCl in stomach and mucus coating	– Physical barrier
(3) Polymorphonuclear leukocytes and monocytes	– Cellular barrier
(4) N.K. cell	– Cellular barrier
- Fever, forms barrier of innate immunity:-
 (1) Physical
 (2) Physiological
 (3) Cellular
 (4) Cytokine
- Incorrect** about bone marrow is :-
 (a) Primary lymphoid organ
 (b) Main lymphoid organ where all blood cells excluding lymphocytes are produced
 (c) Provide micro environment for the development of T-cells
 (d) Produces B-cells
 (1) b (2) c
 (3) b + c (4) All statements are correct
- The exaggerated response of the immune system to certain antigens is called :-
 (1) Primary immune response
 (2) Secondary immune response
 (3) Immune suppression response
 (4) Allergy
- Mark the **incorrect** match :-
 (1) Colostrum = Yellowish fluid, IgA present
 (2) Antivenom = Passive immunisation
 (3) Peyer's patches = PLO of small intestine
 (4) Antibody = H_2L_2
- Primary and secondary immune response are carried out with the help of two special types of _____ present in our blood.
 (1) Macrophages
 (2) Lymphocytes
 (3) Neutrophils
 (4) Monocytes
- Health for a long time was considered as a state of body and mind where there was a balance of certain ____?
 (1) Chemicals (2) Ions
 (3) Humors (4) Hormons
- It was thought that person with ____ belonged to hot personality and would have fevers :-
 (1) High temperature
 (2) Bile
 (3) Black bile
 (4) Yellow bile

13. Which of the following statement is correct?
- (A) Health is affected by genetic disorders, life style and infections.
- (B) Balanced diet personal hygiene and regular exercise are very important to maintain good health.
- (C) Health is only "absence of disease" or "physical fitness"
- (D) "Good humor" hypothesis was disproved by William harvey.
- (1) A, C (2) A, C, D
- (3) A, B, D (4) All are correct
14. Health is a state of complete ____(A)__, ____(B)__, and ____(C)__, well being
- (A) (B) (C)
- (1) Physiological Mental Social
- (2) Mental Physical Economical
- (3) Physical Mental Social
- (4) (2) and (3) both
15. When people are healthy they are?
- (A) More efficient at work
- (B) Decreases productivity
- (C) Brings economic prosperity
- (D) Increases longevity of people
- (E) Increases infant and maternal mortality
- How many statements are correct about healthy people?
- (1) Two (2) Three (3) Four (4) One

Tg: @Chalnaayaaar

HUMAN HEALTH AND DISEASE # 02

1. In _____ disorder, phenylalanine is accumulated and converted into phenylpyruvic acid and other derivative. Accumulation of these in brain results in mental retardation. These are also excreted through urine because of its poor absorption by kidney
(1) Alkaptonuria (2) Phenylketouria
(3) Sick cell anemia (4) Albinism
2. (a) Trisomy of 21
(b) Simian palmer crease
(c) Partially open mouth
(d) Psychomotor development is retarded
Above information are related with :-
(1) Patau's syndrome
(2) Turner's syndrome
(3) Down's syndrome
(4) Edward's syndrome
3. In kidney transplantation, the problem of rejection has largely been overcome by using a drug :-
(1) Flagyl (2) Cyclosporine-A
(3) Amphetamines (4) Pep pills
4. Which of the following is NOT an example of trisomy :-
(1) Down's syndrome
(2) Klinefelter's syndrome
(3) Supermale/Jacob syndrome
(4) Turner's syndrome
5. Hepatitis-B vaccine produced from :-
(1) Bacteria
(2) Recombinant RNA Technology
(3) Fungus
(4) Both 2 and 3
6. Which of the following disease show extra 'Y' chromosome in male?
(1) Turner's syndrome
(2) Jacob's syndrome
(3) Down syndrome
(4) Klinefelter syndrome
7. Choose the incorrect statement :
(1) Alkaptonuria is autosomal recessive gene disorder
(2) Thalassemia is qualitative defect of globin synthesis
(3) Haemophilia is X-linked recessive disease
(4) Patau syndrome is due to aneuploidy
8. Which of the following disease is not an autoimmune disease?
(1) Rheumatoid arthritis
(2) Phenylketoneuria
(3) Myasthenia gravis
(4) Multiple sclerosis
9. Select correct statement.
(1) Thalassemia is qualitative disorder, sickle cell anaemia is quantitative disorder
(2) Thalassemia is quantitative disorder, sickle cell anaemia is qualitative disorder
(3) Both thalassemia and sickle cell anemia are qualitative
(4) Both thalassemia and sickle cell anaemia are quantitative
10. Muscles degenerate in which disease ?
(1) Hashimoto disease
(2) Myasthenia gravis
(3) Diabetes mellitus
(4) Pernicious anaemia
11. Which disease show extra X chromosome in male ?
(1) Turner syndrome
(2) Jacob syndrome
(3) Klinefelter syndrome
(4) Patau's syndrome
12. Black urine disease is due to deficiency of enzyme :
(1) Hydroxylase
(2) Homogentisic acid oxidase
(3) Tyrosinase
(4) β -N-acetyl hexosaminidase
13. How many of following are not autosomal recessive gene mutation disorder ?
(a) Phenyl Ketoneuria
(b) Alkaptonuria
(c) Tay-sach disease
(d) Albinism
(e) Glucose-6 phosphate dehydrogenase deficiency disease
(f) Duchenne Muscular Dystrophy.
(1) One (2) Three
(3) Four (4) Two
14. Trisomy 13th is known as :-
(1) Down's syndrome
(2) Patau's syndrome
(3) Edward syndrome
(4) Cry-du-chat
15. (2n-1) condition is related to :-
(1) Down's syndrome
(2) Turner's syndrome
(3) Klinefelters syndrome
(4) Supermale

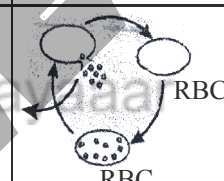
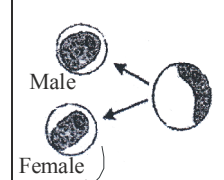
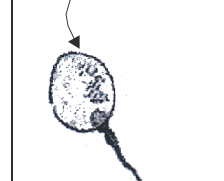
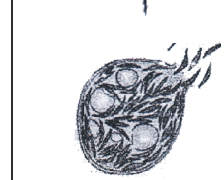
HUMAN HEALTH AND DISEASE # 03

- Which one of the following group is not of infectious diseases ?
(1) Cancer, Allergy, Rheumatoid arthritis
(2) Dysentery, Plaque, Diphtheria
(3) Polio, Pneumonia, Tetanus
(4) Smallpox, Ringworm, Common Cold
- House flies are mechanical carriers of :-
(1) Amoebiasis
(2) Malaria
(3) Common cold
(4) Plague
- Haemophilus influenza* bacteria are responsible for :-
(1) Influenza (2) Pneumonia
(3) Dengue (4) Filariasis
- Salmonella typhi* is a bacteria and causes typhoid, this Pathogen causes lesions and ulceration in the _____.
(1) Stomach wall
(2) Intestinal wall
(3) Gall bladder
(4) Blood vessels
- Match the columns w.r.t. diseases and caustive agents :-

Column-I		Column-II	
a	Pneumonia	p	Rhino viruses
b	Common cold	q	<i>Haemophilus influenza</i>
c	Filariasis	r	<i>Microsporium</i>
d	ringworms	s	<i>Wuchereria bancrofti</i>

- (1) a – p, b – q, c – r, d – s
(2) a – r, b – p, c – s, d – q
(3) a – q, b – p, c – s, d – r
(4) a – p, b – q, c – s, d – r
- (a) Nasal congestion and discharge
(b) Sore throat, hoarseness, cough
(c) Headache, Tiredness etc, are characteres of
(1) Malaria (2) Typhoid
(3) Common cold (4) Pneumonia

- Many fungi belonging to genera *Microsporium*, *Trichophyton* and *Epidermophyton* are responsible for :-
(1) Filariasis (2) Ascariasis
(3) Ringworms (4) Amoebiasis
- Infectious form of *Plasmodium* for human is :-
(1) Sporozoite (2) Mosquito
(3) Haemozoin (4) Schizont
- Find odd one out wrt disease causative agent
(1) Pneumonia (2) Common cold
(3) Plague (4) Diphtheria
- Widal test is done for
(1) Diphtheria (2) Dengue fever
(3) Typhoid (4) Malaria
- Make a glance of a part of the life cycle of *Plasmodium* give below as events A, B, C and D along with their description :-

Events	Description
A 	Parasites reproduce asexually in the red blood cells, bursting the red blood cells and causing cycles of fever
B 	Sexual stage (gametocytes) develop in RBCs of mosquito
C 	Fertilization and development takes place in GUT of mosquito
D 	Mature infective stages (sporozoites) escape from the GUT and migrate to the mosquito salivary glands

How many of the above events are correctly described ?

- (1) One (2) Two
(3) Three (4) Four

12. When a female *Anopheles* mosquito bites an infected person, the parasite enter the mosquitoes bodies in many forms. Which of these is the infective form for mosquito ?

(1) Sporozoite (2) Gamete form
(3) Gametocyte (4) Schizont

13. Select the incorrect match in the table given below :-

	Disease	Causative agent
(1)	Common cold	Rhino virus
(2)	Typhoid	<i>Salmonella typhi</i>
(3)	Pneumonia	<i>Haemophilus influenzae</i>
(4)	Plague	<i>Xenopsylla</i>

14. Choose the odd one out w.r.t. viral disease :-

(1) Pneumonia (2) influenzae
(3) Dengue (4) Small pox

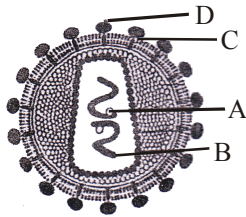
15. Which of the following is not correct about pneumonia ?

(A) It is caused by *streptococcus pneumoniae*.
(B) Infects the alveoli of the lungs.
(C) Symptoms of pneumonia include fever, chills, Cough and headache.
(D) In all cases the lips and finger nails turn blue to grayish in colour.

(1) A, B, D (2) B and D
(3) D only (4) A, B, C, D

HUMAN HEALTH AND DISEASE # 04

- Which biological response modifier activates immune system and helps in destroying the tumor ?
(1) α -interferons (2) Taxol drug
(3) Cytokines (4) Vincristin drug
- Burkitt's lymphoma is caused by :-
(1) EBV (2) HPV (3) HIV (4) POX-Virus
- Following diagram of HIV shows which parts marked as A, B, C and D respectively :-



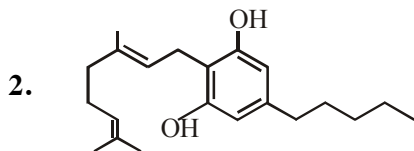
- (1) SS-RNA, Reverse transcriptase, Lipoprotein, GP-120
(2) GP-120, SS-RNA, Reverse transcriptase, Lipoprotein
(3) Reverse transcriptase, SS-RNA, Lipoprotein, GP-120
(4) GP-120, Lipoprotein, SS-RNA, Reverse transcriptase
- How many statements are correct for AIDS ?
(A) Core of HIV has 2 identical molecule of dsDNA
(B) GP120 has complementary sequence for CD-8 receptors
(C) AIDS caused by HIV virus
(D) Macrophage become HIV factory after HIV infection
(1) One (2) Three
(3) Two (4) Four
- Replication of HIV takes place in :-
(1) TH cells (2) TK cells
(3) Macrophage (4) Both 1 and 3
- Which infection more often spreads due to conscious behaviour pattern ?
(1) HIV (2) Cancer
(3) Pneumonia (4) Typhoid
- Which property is not shown by cancer cells?
(1) Metastasis
(2) Uncontrolled division
(3) Contact inhibition
(4) Invasion

- Breast cancer is type of :-
(1) Carcinoma (2) Sarcoma
(3) Leukemia (4) Lymphoma
- The genetic material of HIV is :-
(1) dsDNA
(2) dsRNA
(3) ssDNA
(4) ssRNA
- HIV that causes AIDS, first starts destroying:
(1) Erythrocytes
(2) Helper T- Lymphocytes
(3) Thrombocytes
(4) B- Lymphocytes
- A certain patient is suspected to be suffering from Acquired Immuno Deficiency Syndrome. Which diagnostic technique will you recommend for its detection ?
(1) ELISA (2) MRI
(3) Ultra sound (4) WIDAL
- Which of the following cancer is not the type of carcinoma ?
(1) Breast cancer (2) Lung cancer
(3) Cervical cancer (4) Bone cancer
- Which statement is false ?
(1) Normal cells show a property called contact inhibition
(2) Metastasis is the most feared property of benign tumours
(3) Proto oncogenes when activated under certain conditions, could lead to oncogenic transformation
(4) Early detection of cancer is essential as it allows the disease to be treated successfully in many cases
- Consider the following characteristics and answer the question.
(a) Metastasis
(b) Contact inhibition
(c) Uncontrolled meiosis
(d) Malignancy
(e) Invasion
(f) Oncogenic transformation
The properties shown by malignant tumor are?
(1) a, b, d, e, f (2) a, d, e, f
(3) a, b, d, e (4) a, b, c, d, e, f

HUMAN HEALTH AND DISEASE # 05

1. Cannabinoid receptors present principally in :-

- (1) Heart (2) Liver
(3) Brain (4) GIT



is the structural formula of :-

- (1) Opioid molecule
(2) Cannabinoid molecule
(3) Morphine
(4) LSD

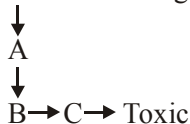
3. Which of the following is not cannabinoid ?

- (1) Heroin (2) Hashish
(3) Marijuana (4) Ganja

4. Which of the following drug interferes with the transport of the neuro-transmitter dopamine ?

- (1) Morphine (2) Smack
(3) Cocaine (4) Marijuana

5. Alcoholic beverage



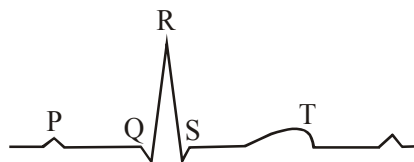
In the above diagram what is A, B and C respectively ?

	A	B	C
1	Stomach	Ethyl alcohol	Acetaldehyde
2	Ethyl alcohol	Acetaldehyde	Liver
3	Ethyl alcohol	Liver	Acetaldehyde
4	Liver	Acetaldehyde	Ethyl alcohol

6. Vascular grafts used in coronary artery bypass grafting taken from all except?

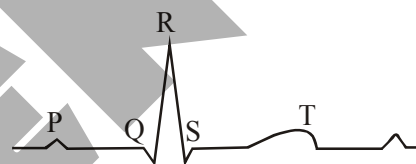
- (1) Saphenous vein
(2) Radial artery
(3) Aorta
(4) Internal mammary artery

7. In given diagram QRS complex represent :



- (1) Ventricular repolarisation
(2) Atrial depolarisation
(3) Ventricular depolarisation
(4) Atrial repolarisation

8. In a standred ECG. Select the correct statement for given figure :-



- (1) P wave – Represents depolarisation of ventricles
(2) Ventricular diastole starts after Q wave
(3) End of the T wave marks the end of the systole
(4) T wave represents the repolarisation of atria

9. Smoke of tabacco contains :-

- (1) Carcinogen (2) Nicotine
(3) CO (4) All

10. Which of the following combination is not a cannabinoids ?

- (1) Charas, Ganja
(2) Datura, LSD
(3) Charas, Hashish
(4) Marijuana, Bhang

ORIGIN AND EVOLUTION # 01

- Which theory can explain the origin of universe?
(1) Cosmic panspermia theory
(2) Theory of natural selection
(3) Big-bang theory
(4) Theory of special creation
- Who experimentally disproved the theory of spontaneous generation?
(1) Louis Pasteur
(2) Oparin & Haldane
(3) Stanley Miller
(4) Hugo deVries
- The life could have come from:
(1) Outer space with cosmic rays
(2) Dead and decaying matter
(3) Pre-existing non-living organic molecules
(4) Another planet in form of spores
- What is paramount necessity for origin of life?
(1) Light (2) Air
(3) Water (4) Oxygen
- What is the correct sequence of formation of various structures in order of origin of life?
I. Protobionts
II. Simple organic molecules
III. Eobionts
IV. Complex organic molecules
Options:
(1) I, II, III, IV (2) II, I, III, IV
(3) II, IV, I, III (4) III, II, I, IV
- The first living organisms on earth were:
(1) Chemoautotrophs, anaerobic
(2) Chemoheterotrophs, aerobic
(3) Photoautotrophs, aerobic
(4) Chemoheterotrophs, anaerobic
- Experimental evidences in favour of chemical evolution were provided by:
(1) Louis Pasteur
(2) Haldane
(3) Stanley Miller
(4) Oparin

- Identify the correct match from column-I and column-II:

	Column – I		Column – II
P	Origin of universe	I	3 bya
Q	Origin of Earth	II	20 bya
R	Origin of first cellular form of life	III	4.5 bya
S	Origin of first noncellular form of life	IV	2 bya

Options:

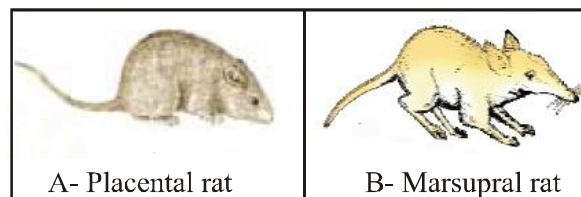
- (1) P-I, Q-II, R-III, S-IV
(2) P-II, Q-III, R-IV, S-I
(3) P-II, Q-IV, R-III, S-I
(4) P-I, Q-III, R-II, S-IV
- Select the **correct** statement:
(1) Life originated on earth after 4 billion years of origin of earth
(2) Prokaryotic cells are formed after the formation of eukaryotic cells
(3) Water and oxygen are two essential components for the origin of life through chemosynthesis
(4) First non-cellular forms of life would have been giant molecules like RNA, protein, polysaccharides etc.
- Which statement is not true about the theory of big bang?
(1) It can explain the origin of universe
(2) It can explain the origin of life
(3) It can explain the origin of solar system
(4) It can explain the origin of galaxies
- The temperature maintained by Miller in his experiment to prove the chemical evolution:
(1) 25 °C (2) 800 °C
(3) 5000 °C (4) 100 °C

12. Read two statements (a) and (b) carefully and select the correct option regarding them:
(a) The first life on earth was chemoautotrophic and anaerobic.
(b) Protobionts could exhibit simple metabolism and reproduction.
Options:
(1) Statement (a) is correct but statement (b) is incorrect
(2) Statement (a) is incorrect but statement (b) is correct
(3) Both statements are correct
(4) Both statements are incorrect
13. Which is not a property of protobionts?
(1) Colloidal drops like structures
(2) Able to grow in size
(3) Able to reproduce
(4) Clusters of macromolecules
14. First inorganic and organic molecule formed on earth were respectively :
(1) Water and ammonia
(2) Water and methane
(3) Ammonia and amino acids
(4) Ammonia and carbon dioxide
15. Which is an example of retrogressive evolution?
(1) Formation of virus like structures
(2) Formation of prokaryotic cells
(3) Formation of eukaryotic cells
(4) Formation of protobionts

ORIGIN AND EVOLUTION # 02

- Which two periods are correctly matched with the dominance of organisms in that particular period?
 - (A) Jurassic – Amphibians
 - (B) Carboniferous – Fishes
 - (A) Jurassic – Amphibians
 - (B) Devonian – Fishes
 - (A) Devonian – Amphibians
 - (B) Jurassic – Dinosaurs
 - (A) Devonian – Fishes
 - (B) Jurassic – Dinosaurs
- Which ancestor is shared by birds, crocodiles and dinosaurs?
 - Thecodonts
 - Synapsids
 - Pelycosaurs
 - Archaeopteryx*
- Which is an example of atavistic structure?
 - Non functional auricular muscles
 - Nictitating membrane
 - Segmented muscles of abdomen
 - Tail in new born baby
- Which option is not an example of analogous organs?
 - Wings of butterfly and birds
 - Eyes of octopus and mammals
 - Potato and ginger
 - Potato and sweet potato
- The most common fossils found in earth's crust are:
 - Petrified fossils
 - Mould fossils
 - Unaltered fossils
 - Coprolites
- Which is a pair of vestigial organs in human?
 - Nail, Coccyx
 - Coccyx, Nictitating membrane
 - Eyelids, Coccyx
 - Third molars, Nail
- The ratio of radioactive and non radioactive form of an element in a sample of rock is 1:15. Estimate the age of rock if the half life of radioactive element is 3 billion years.
 - 3 billion years
 - 6 billion years
 - 1.5 billion years
 - 12 billion years

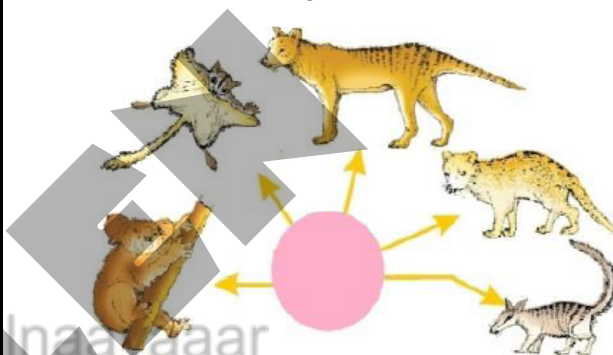
8. The organism A and B are example of:



A- Placental rat

B- Marsupial rat

- Convergent evolution
 - Divergent evolution
 - Adaptive convergence
 - Both (1) & (3)
9. What is not true about the organisms given below in the diagram?



- They all are example of convergent evolution
 - They all are example of adaptive radiation
 - They have evolved from a common ancestor
 - They all are Australian marsupials
10. Some statements are given for wings of bat and butterfly:
- They are anatomically similar
 - They are homologous structure
 - They are result of divergent evolution
 - They perform different functions
 - They are example of adaptive divergence
 - They indicates common ancestry
- How many statements are correct?
- Zero
 - One
 - Two
 - Three
11. Which is not amongst the ancestry line of mammals?
- Sauropsids
 - Synapsids
 - Pelycosaurs
 - Therapsids

12. Pouched mammals survived in Australia but not in other continents, because:
- (1) Climate of Australia was cold
 - (2) Pouched mammals have high adaptive power
 - (3) They lack competition from other mammals
 - (4) They have high reproductive capacity
13. When organism of one ancestral stock shows similarities with the organism of another ancestral stock based on the habitat and feeding habit, than this phenomenon can be called as:
- (1) Convergent evolution
 - (2) Divergent evolution
 - (3) Adaptive divergence
 - (4) Adaptive radiation
14. Some examples are given below:
- (a) Forelimbs of mammals
 - (b) Thorn of Bougainvillea and tendril of cucurbita
 - (c) Eyes of the octopus and and mammals
 - (d) Flippers of penguins and dolphins
 - (e) Sweet potato and potato
 - (f) Wings of birds and butterfly
- How many examples among these are the examples of analogous structures in animals?
- Options:**
- (1) One (2) Two (3) Three (4) Four
15. Which is correctly matched?
- (1) 500 mya – Invertebrates formed
 - (2) 320 mya – Jawless fishes evolved
 - (3) 3000 mya – First cellular form of life appeared
 - (4) 65 mya – Dinosaurs appeared

ORIGIN AND EVOLUTION # 03

1. Only two statements are correct among the given five statements. Identify them:
- (A) Fitness is the end result of ability to adapt and get selected by nature.
- (B) Members of a population don't vary in characteristics.
- (C) Mutation is a continuous source of variations.
- (D) Evolution is a single step process called saltation.
- (E) Evolution is not a directed process in the sense of determinism.

Options:

- (1) A, E (2) A, B
(3) C, D (4) D, E

2. Which conclusion can be made on the basis of experiment of Lederberg?

- (1) Already existed adaptive mutations provide selection advantage to the individuals of a population
- (2) Already existed harmful mutations provide selection advantage to the individuals of a population
- (3) Individuals of a population develop new characters in response to changed environment which helps in their selection
- (4) Any change in environment doesn't affect the individuals of a population

3. The common and continuous source of variations in a population is :

- (1) gene recombination
(2) mutation
(3) genetic drift
(4) gene flow

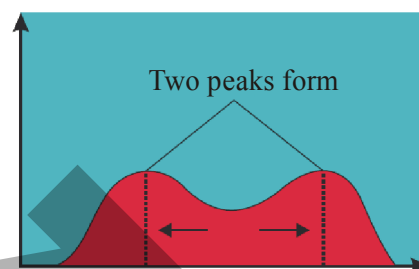
4. Which is not true for directional selection?

- (1) Only one extreme value is selected
(2) Mean value never change
(3) Operates in changing environment
(4) Peak shifts in one direction

5. Weismann's theory of continuity of germplasm disproves the theory of:

- (1) Theory of Lamarck
(2) Theory of biogenesis
(3) Theory of Darwin
(4) Theory of mutation

6. Which type of natural selection is shown in given graphical representation?



- (1) Stabilizing selection
(2) Directional selection
(3) Disruptive selection
(4) Artificial selection

7. Read four statements (a-d) carefully:

- (a) Natural resources are unlimited.
- (b) Populations are stable in size except for seasonal fluctuations.
- (c) Members of a population vary in characteristics.
- (d) There is no competition for resources among the individuals of a population.

How many statements are correct among these?

- (1) One (2) Two (3) Three (4) Four

8. Mutations are ____ (A) ____ and ____ (B) ____ while Darwinian variations are ____ (C) ____ and ____ (D) _____. Fill in the blanks for A, B, C and D from the options given in the table below:

	A	B	C	D
1	Small	Directional	Random	Directionless
2	Directional	Large	Small	Directionless
3	Random	Directionless	Small	Directional
4	Large	Directional	Small	Directional

9. If members of two different species can't mate due to difference in their breeding seasons then this type of reproductive isolation is called as:
 - (1) Mechanical isolation
 - (2) Temporal isolation
 - (3) Ecological isolation
 - (4) Postzygotic isolation
10. Production of improved varieties of domesticated animals is an example of:
 - (1) Natural selection (2) Artificial selection
 - (3) Sexual selection (4) All of these
11. The observations about the number of white winged and dark winged moths in England during different environmental conditions shows that:
 - (1) Predators can't spot a moth against contrasting background
 - (2) No variant is completely wiped out
 - (3) The areas where industrialization did not occur, the count of melanic moths was high
 - (4) Moths that were able to camouflage themselves, didn't survive
12. The source of variations in an asexually reproducing population:
 - (1) Mutation
 - (2) Gene recombination
 - (3) Both (1) & (2)
 - (4) Hybridization
13. The different varieties of beaks in black birds observed by Darwin were present in:
 - (1) Galapagos island (2) Australia
 - (3) England (4) Africa
14. When a species splits into two or more geographically isolated populations and these populations finally form new species, then it is called as:
 - (1) Sympatric speciation
 - (2) Allopatric speciation
 - (3) Phyletic speciation
 - (4) Quantum speciation
15. Which kind of mimicry is shown by viceroy butterfly and monarch butterfly?
 - (1) Batesian mimicry
 - (2) Aggressive mimicry
 - (3) Mullerian mimicry
 - (4) Both 1 and 2 mimicry

ORIGIN AND EVOLUTION # 04

- The only true statement about the prehistoric man *Homo habilis* is:
 - It was the first man who used fire
 - It was the first man who made tools
 - It was the first man who painted cave walls
 - It was the first man who used hides to protect body
- Which is not a characteristic of human?
 - Parallel thumb to palm
 - Semicircular jaw
 - Bipedal locomotion
 - Opposable thumb
- Identify the correct match from column – I, II and III :

	Prehistoric man		Cranial capacity		Fossils discovered from
A	Java man	i	1400 cc	a	China
B	Peking man	ii	1650 cc	b	Java
C	Neanderthal man	iii	1050 cc	c	Germany
D	Cro-Magnon man	iv	900 cc	d	France

Options:

- A-i-b, B-ii-c, C-iii-d, D-iv-a
 - A-ii-c, B-iii-d, C-iv-a, D-i-b
 - A-i-d, B-ii-a, C-iii-b, D-iv-c
 - A-iv-b, B-iii-a, C-i-c, D-ii-d
- About how many years ago *Dryopithecus* and *Ramapithecus* were existed?
 - 15 million years ago
 - 50,000 years ago
 - 1,40,000 years ago
 - 18,000 years ago

- Which is not correctly matched among the following options?
 - Homo habilis* – Brain capacity 650 – 800 cc
 - Homo erectus* – Fossils discovered in Java
 - Neanderthal man – First human being like creature
 - Homo sapiens* – Arose in Africa
- The first man who used hides to protect their body and buried their dead:
 - Homo sapiens*
 - Neanderthal man*
 - Homo erectus*
 - Homo habilis*
- Pre historic cave arts were developed by:
 - Homo erectus*
 - Homo sapiens*
 - Australopithecines*
 - Homo habilis*
- Which statement is not true about *Australopithecines*?
 - They lived approx 2 million years ago
 - They probably lived in east African grasslands
 - They hunted with stones
 - They didn't eat fruit
- Who is the direct ancestor of modern man?
 - Cro-Magnon man
 - Java man
 - Peking man
 - Neanderthal man
- Which is not correctly matched?
 - Modern man – First man who started agriculture
 - Neanderthal man – First man who started to buried dead bodies
 - Peking man – First man who started use of fire
 - Cro-Magnon man – First man who painted walls of caves

11. Which was the first human being like creature?
 (1) *Ramapithecus*
 (2) *Dryopithecus*
 (3) *Australopithecines*
 (4) *Homo habilis*
12. Which statement is not true about *Ramapithecus* and *Dryopithecus*?
 (1) They existed about 15 million years ago
 (2) They were hairy and walked like gorilla and chimpanzee
 (3) *Ramapithecus* was more man like
 (4) *Dryopithecus* was more man like
13. Which man fossil is incorrectly matched with its cranial capacity?
 (1) *Homo habilis* – 650-800 cc
 (2) *Homo erectus* – 900 cc
 (3) Neanderthal man – 1400 cc
 (4) Cromagnon man – 1300 cc
14. The correct sequence of evolution of man:
 I. *Homo habilis*
 II. Java Man
 III. Modern Man
 IV. Cro-magnon man
 Options:
 (1) II, I, III, IV
 (2) II, I, IV, III
 (3) I, II, III, IV
 (4) I, II, IV, III
15. Which is considered as the connecting link between apes and men?
 (1) *Ramapithecus*
 (2) *Dryopithecus*
 (3) *Australopithecus*
 (4) *Homo habilis*

DOMESTICATION OF ANIMALS # 02

1. Which one of the following is a fresh water fish?

- (1) Catla (2) Hilsa
(3) Sardines (4) Mackerel

2. Which statement is not true about bee keeping?

- (1) It is a labour intensive work.
(2) In India, the most common species of bee is *Apis indica*.
(3) Honey is a food of high nutritive value.
(4) Beewax can be used in preparation of cosmetics and polishes.

3. The main constituent of lac is:

- (1) Fructose (2) Dye
(3) Wax (4) Resin

4. Identify the correct match from following table:

Diseases	Causative agent
(A) Cowpox	(i) Rhabdo virus
(B) Rinderpest	(ii) Paramyxo virus
(C) Foot & Mouth disease	(iii) Orthopox virus
(D) Rabies	(iv) Picorna Virus

Options:

- (1) A- i, B- ii, C- iii, D- iv
(2) A-iii, B -ii, C- i, D- iv
(3) A -iii, B - iv, C- i, D- ii
(4) A - iii, B-ii, C- iv, D- i

5. The boiling of cocoon of silkworm in hot water is called as:

- (1) Stifling (2) Reeling
(3) Spinning (4) Thinning

6. Read the following four statements carefully and select the option which includes only correct statements:

- (a) Pisciculture is rearing, catching and management of pigs.
(b) Isin glass is a byproduct of fishing industry.
(c) Honey is the primary product of honey bee.
(d) Quality of lac doesn't depend on the nature of host plant.

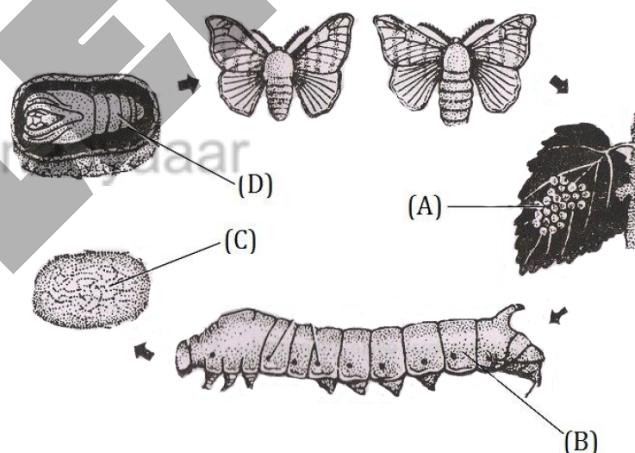
Options:

- (1) Statement (a) only
(2) Statements (a), (b) and (c)
(3) Statements (b) and (d)
(4) Statement (b) only

7. "Hypophysation" is a term used for

- (1) Natural breeding of cattle.
(2) Artificial induced breeding of broilers
(3) Induced breeding technique in the fishes
(4) Natural breeding in fishes.

8. Observe the given life cycle of Silkworm carefully and select the correct option given four stages A, B, C and D:



	(A)	(B)	(C)	(D)
1	Unfertilized eggs	Wriggler	Cocoon	Chrysalis
2	Fertilized eggs	Caterpillar	Adult	Pupa
3	Unfertilized eggs	Nymph	Resin Chamber	Adult
4	Fertilized eggs	Caterpillar	Cocoon	Chrysalis

9. A female donkey can be artificially inseminated with the sperms of a male horse to produce a sterile hybrid animal, this type of mating is known as:
- (1) Intergeneric hybridization
 - (2) Inbreeding
 - (3) Interspecific hybridization
 - (4) Out crossing
10. The rearing, catching, processing and selling of fishes along with other edible aquatic animals is called as:
- (1) Fisheries
 - (2) Pisciculture
 - (3) Aquaculture
 - (4) Aquarium
11. Silk is obtained from:
- (1) *Bombyx mori*
 - (2) *Laccifer lacca*
 - (3) *Bos indicus*
 - (4) *Apis indica*
12. Lac is a resinous substance which is a-
- (1) Secretion of salivary gland of lac insect
 - (2) Excretory product of lac insect
 - (3) Secretion of dermal glands of lac insect
 - (4) Secretion of maxillary gland of lac insect

Tg: @Chalnaayaaar

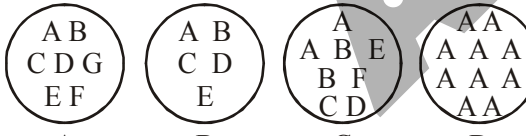
ECOLOGY # 01 (ORGANISM, POPULATION, COMMUNITY, SUCCESSION)

1. (i) Organism A $\xrightarrow[\text{study}]{\text{Interact with}}$ Environment $\rightarrow$ P

- (ii) Group of organism of different species B $\xrightarrow[\text{study}]{\text{Interact with}}$ Environment $\rightarrow$ Q

then P and Q are called as.

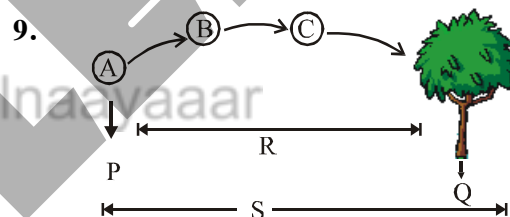
- (1) Autecology, Synecology
 - (2) Autecology, Autecology
 - (3) Synecology, Synecology
 - (4) Synecology, Autecology
2. Physiological ecology tries to understand :-
- (1) How different type of organisms interact among themselves.
 - (2) How different type of ecosystems interact with local abiotic factors.
 - (3) How different organisms are adapted to environments in forms of not only survival but also reproduction
 - (4) How different type of abiotic factors interact among themselves and one factor remains limiting
3. Fig trees can maintain community structure during food scarcity in tropical deciduous forest. These act as
- (1) Exotic species
 - (2) Pioneer species
 - (3) Edge species
 - (4) Key stone species

4. 
- A: AB, CD, EF
B: AB, CD, E
C: A, AB, E, B, F, CD
D: AA, AA, AA, AA, AA, AA

In above diagram four areas are given. In which area has maximum and minimum species diversity respectively.

- (1) Maximum = B, Minimum = D
 - (2) Maximum = A, Minimum = D
 - (3) Maximum = A, Minimum = B
 - (4) Maximum = C, Minimum = D
5. Ecological succession usually focuses on which changes ?
- (1) type of animals
 - (2) type of decomposers
 - (3) vegetation
 - (4) humus content

6. Which species have high value of biotic potential and short generation time?
- (1) Pioneer species
 - (2) Climax species
 - (3) Seral species
 - (4) Sere
7. Which of the following parameter decreases as succession proceeds?
- (1) Humus content
 - (2) Species diversity
 - (3) Net community productivity
 - (4) Biomass
8. Primary succession is development of biotic communities on :-
- (a) Newly exposed habitat
 - (b) Cleared forest area
 - (c) Freshly harvested crop field
 - (d) Pond filled after a dry season
- (1) only a (2) a & d (3) a, c, d (4) b, c, d



In above given diagram Identify P, Q, R, S respectively and give correct option:-

- (1) P $\rightarrow$ pioneer community, Q $\rightarrow$ Climax community, R $\rightarrow$ Sere, S $\rightarrow$ Seral community
 - (2) P $\rightarrow$ Climax community, Q $\rightarrow$ Sere, R $\rightarrow$ Seral, S $\rightarrow$ Pioneer community
 - (3) P $\rightarrow$ Pioneer community, Q $\rightarrow$ Climax community, R $\rightarrow$ Seral community, S $\rightarrow$ Sere
 - (4) P $\rightarrow$ Climax community, Q $\rightarrow$ Seral, R $\rightarrow$ Sere, S $\rightarrow$ Pioneer community
10. Which of the following zone of the lake also known as ecotone and has maximum species diversity ?
- (1) Limnetic zone
 - (2) Profundal zone
 - (3) Benthic zone
 - (4) Littoral zone

ECOLOGY # 02 (INTERSPECIFIC INTERACTIONS)

1. Select the correct match :

	A Key stone species	B Critical link species	C Endemic species
(1)	Meta sequoia in china valley	Lion in forest	Mycorrhizal fungi
(2)	Kangaroo in Australia	Fig tree in tropical forest	Pollinator insect
(3)	Kangaroo rat in desert	Mycorrhizal fungi	Meta sequoia in china valley
(4)	Lion in forest	Kangaroo in Australia	Pollinator insect

2. Select the correct match :-

	A Mutualism	B Parasitism	C Commensalism
(1)	Barnacle & Whale	<i>Loranthus</i> & mango	<i>Yucca</i> plant & <i>pronuba</i> moth
(2)	Leech on cattle	Orchid & Bee	Pilot fish & shark
(3)	Fig tree & wasp	<i>Viscum</i> & Oak	Orchid & mango
(4)	Sucker fish & shark	Lichen	Ticks on dog

3. Select the correct match in the following :-

- (1) Brood parasitism - Partial stem parasite
- (2) Holoparasite - Cuckoo & crow
- (3) Hemiparasite - Parasite which totally dependent upon the host
- (4) Hyper parasite - A parasite living on another parasite

4. The Prickly pear cactus introduced into Australia in the early 1920's caused havoc by spreading rapidly in to millions of hectares of rangeland because -

- (1) There is no competitor
- (2) Due to less intra specific competition
- (3) Absence of natural predator
- (4) Availability of high nutrient

5. Mark the important defence mechanism in plants against herbivory :-

- (1) Spines
- (2) Toxic chemical
- (3) Both (1) & (2)
- (4) Green leaves

6. In rocky Intertidal communities removal of which of the following predator became the cause of extinction of 10 species of invertebrates?

- (1) Abingdon tortoise
- (2) Monarch butterfly
- (3) *Pisaster* starfish
- (4) *Calotropis*

7. The Abingdon tortoise in galapagos island became extinct with in decade after goats were introduced on the island is the example of :

- (1) Competitive release
- (2) Resource partitioning
- (3) Interference competition
- (4) Competitive exclusion

8. Identify the correct match from the column I, II and III.

Column-I	Column-II	Column-III
1. Mutualism	a. (+, -)	i. Visiting flamingoes and resident fishes in south american lakes
2. Competition	b. (+, 0)	ii. Starfish <i>Pisaster</i> in american pacific coast
3. Predation	c. (+, +)	iii. Cattle egret birds and cattle
4. Commensalism	d. (-, -)	iv. Lichens

- (1) 1 - d - iv, 2 - c - i, 3 - a - ii, 4 - b - iii
- (2) 1 - c - iv, 2 - d - i, 3 - a - ii, 4 - b - iii
- (3) 1 - c - iv, 2 - d - iii, 3 - a - ii, 4 - b - i
- (4) 1 - d - iv, 2 - c - i, 3 - b - ii, 4 - a - iii

9. What benefits does fig tree offers to wasp in return for its pollination ?

- (1) Delicious fruits
- (2) Nectar
- (3) Pollens
- (4) Oviposition and developing seeds

10.



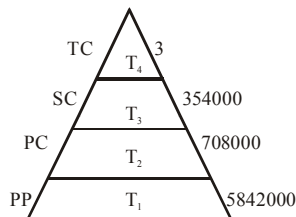
Which of the following statement is incorrect with respect to the above given figure ?

- (1) One petal of the flower bears an uncanny resemblance to the female bumble bee in size, colour and markings.
- (2) The female bumble bee is a critical link species which helps in pollination of the flower.
- (3) The flower employs 'Sexual deceit' to get pollination done by a particular species of bumble bee.
- (4) Male bumble pseudocopulates with the flower.

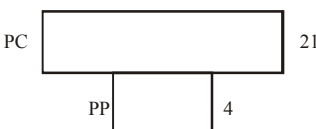
ECOLOGY # 03
(BIOTIC COMPONENT, FOOD CHAIN, FOOD WEB, PYRAMID, PRODUCTIVITY)

- Which of the following ecosystem has the highest gross primary productivity :-
(1) mangrove (2) rain forest
(3) grassland (4) coral reef
- Mass of living matter at a trophic level in an area at anytime is called :-
(1) Standing state (2) Standing crop
(3) Detritus (4) Humus
- Which of the following group is essential component for survival of an ecosystem :-
(1) Producers
(2) Producers and herbivores
(3) Producers and decomposers
(4) Detritivores
- In an ecosystem, which one shows one-way passage :-
(1) energy (2) carbon (3) nitrogen (4) potassium
- Concept of ecological pyramids was proposed by:-
(1) Odum (2) Tansley
(3) Reiter (4) Charles Elton
- Guild is
(1) Organism which have similar trophic level
(2) Organism which have different trophic level
(3) Producer's and consumer's of ecosystem
(4) Consumer's of ecosystem
- The four pyramids (A, B, C and D) given below represent four different type of ecosystem ecological pyramids, which one of these is correctly identified in the options given, along with its correct ecosystem & type of pyramid:-

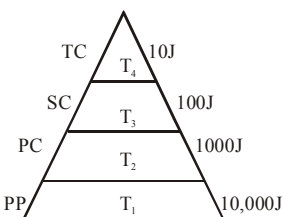
(A)



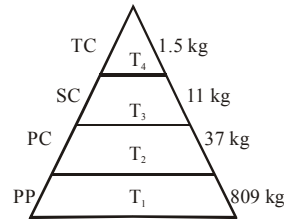
(B)



(C)

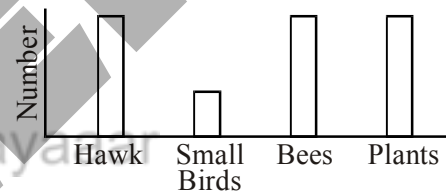


(D)

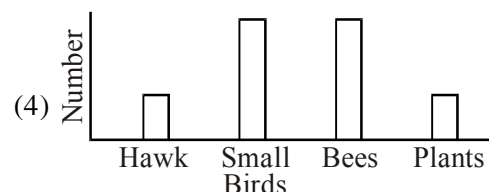
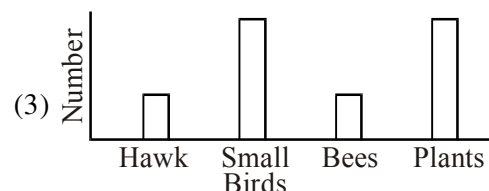
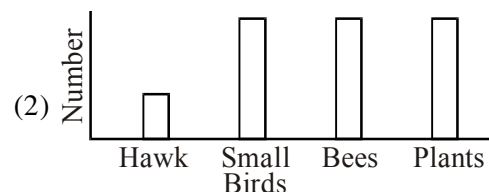
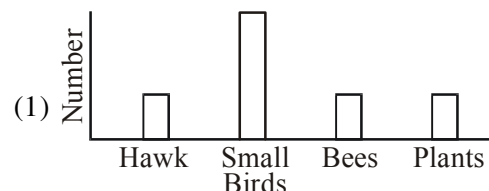


		Type of pyramid	Ecosystem
1	A	Pyramid of number	Tree ecosystem
2	B	Pyramid of biomass	Grassland
3	C	Pyramid of Energy	Grass land Ecosystem
4	D	Pyramid of number	Tree Ecosystem

- In an ecosystem, four major interdependent components were in the given proportions :



What would be the new composition of the same ecosystem when majority of the Hawk were killed



9. Plant → Insect → P → Snake → Hawk

In above given food chain identify P:-

- (1) Frog (2) Cobra (3) Fox (4) Lion

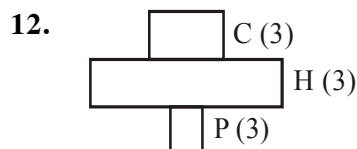
10. Plant → Rabbit → Wolf → Lion

In above food chain if plant produce 1000 KCal energy during photosynthesis then How much amount of energy available for wolf in given food chain ?

- (1) 100 KCal (2) 1 KCal
(3) 10 KCal (4) .1 KCal

11. Which of the following is an example of artificial ecosystem ?

- (1) Crop land ecosystem
(2) Tree ecosystem
(3) Grass land ecosystem
(4) desert ecosystem



Above pyramid showing :-

- (1) Pyramid of number in a grassland
(2) Pyramid of biomass in lake
(3) Pyramid of biomass in ocean
(4) Pyramid of number in tree ecosystem

13. Which one is **incorrect** about ecological pyramids ?

		Number	Biomass	Energy
1	Lake			
2	Grassland			
3	Ocean			
4	Tree			

14. Choose the **incorrect** one regarding ecological pyramids :-

- (1) No place for decomposers
(2) Represent unidirectional flow of energy
(3) Can represent food web
(4) Is erect for number of organisms in grassland ecosystem.

15. Which statement is true concerning this food chain-
Grass → Rabbits → Snakes → Hawk:-

- (1) Each population is omnivores
(2) Each predator population has a greater biomass than its prey population
(3) Both (1) and (2)
(4) Each population has a greater biomass than its predator population

16. Producer Primary Secondary Top

(I) Plant → Insect → Frog → Eagle

(II) Plant → Rat → Snake → Peacock

When food chain I will connected with food chain-II and snake eats frog then snake is :-

- (1) Primary consumer
(2) Secondary consumer
(3) Tertiary consumer
(4) Top consumer

ECOLOGY # 04

(ABIOTIC COMPONENT OF ECOSYSTEM AND ADAPTATIONS IN ORGANISMS)

- Which of the following is not an abiotic component of an ecosystem :-
(1) water (2) minerals
(3) litter (4) micro-organisms
- How much amount of incident solar radiation (ISR) is used in the photosynthesis process by plants :-
(1) 1-5% (2) 5-10%
(3) 20-40% (4) 50-70%
- Which of the following is most ecologically relevant environmental abiotic factor :-
(1) light (2) temperature
(3) soil (4) water
- Which of the following is not a physiological adaptation :-
(1) Blubber in whale, seal in antarctica region
(2) Antifreezing protein
(3) Increase number of RBC in blood at high altitude
(4) In cactus leaves modified into spines
- Under certain conditions soil nutrients get tied up with the biomass of microbes and becomes temporarily unavailable to other organism such incorporation of nutrients is called -
(1) Nutrient immobilisation
(2) Acclimatisation
(3) Mineralisation
(4) Leaching
- Which one of the following processes during decomposition is **correctly** described ?
(1) Leaching - Water soluble inorganic nutrients rise to the top layers of soil
(2) Fragmentation - Carried out by organisms such as earthworm
(3) Humification - Leads to the accumulation of a dark coloured substance humus which undergoes microbial action at a very fast rate
(4) Catabolism - Last step in the decomposition under fully anaerobic condition

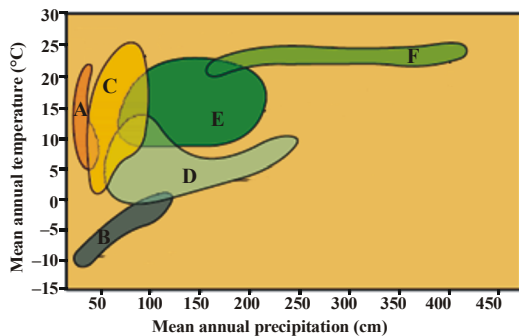
- Identify the correct match from the following column I, II and III :-

Column I		Column II		Column III	
(1)	Eurythermal	(a)	Able to tolerate narrow range of temperature	(i)	99% Animals
(2)	Stenothermal	(b)	A stage of suspended development	(ii)	Thermoregulation
(3)	Conformers	(c)	Body temp. changes with ambient temp.	(iii)	Zooplanktons
(4)	Diapause	(d)	Able to tolerate wide range of temp.	(iv)	Poikilothermal

- 1-b-ii, 2-c-iii, 3-a-i, 4-d-iv
 - 1-d-ii, 2-a-i, 3-b-iv, 4-c-iii
 - 1-d-ii, 2-a-iv, 3-c-i, 4-b-iii
 - 1-a-iii, 2-b-ii, 3-d-iv, 4-c-i
- How many of the following are **correct** ?
(A) On planet earth life exists in just few favorable habitats not in extreme and harsh habitats
(B) Our intestine is a unique habitat for hundreds of species of microbes
(C) Physio-chemical components along do not characterise the habitat of an organism completely
(D) Habitate includes biotic components also with which organism interact constantly
(E) Over a period of time, the organism had through natural selection evolved adaptations to optimise it's survival and reproduction in it's habitat
(F) Mango tree do not and can not grow in temperate countries, Tuna fish are rarely caught beyond tropical latitudes
(1) 6 (2) 5 (3) 4 (4) 3

ECOLOGY # 05
(NUTRIENT CYCLE, BIOME & BIOSPHERE)

1. Which of the following statement is correct with respect to different biomes represented in the given figure :-



- (1) Biome 'A' and 'C' show high annual temp and they are highly rich in vegetation
(2) Biome 'C' and 'D' have same temperature as well as rainfall but their vegetation type is similar
(3) Biome 'A' and 'B' differ in their mean annual temperature but both have very low vegetation
(4) Biome 'A' and 'C' have low precipitation and thus vegetation type is similar
2. Which of the following pairs is a sedimentary type of biogeochemical cycle :-
(1) phosphorus and nitrogen
(2) phosphorus and sulphur
(3) oxygen and nitrogen
(4) phosphorous and carbondioxide
3. About 70% of total global carbon is found in:-
(1) forest
(2) grassland
(3) agroecosystem
(4) oceans
4. The correct ascending order of temperature is:-
(1) Polar areas → Temperate areas → sub tropical areas → Tropical areas
(2) Equator → Timber line → Tropical deserts
(3) Deep sea hydrothermal vents → Tropical deserts → mountain top
(4) Polar areas → Tropical deserts → Mountain top → Timber line

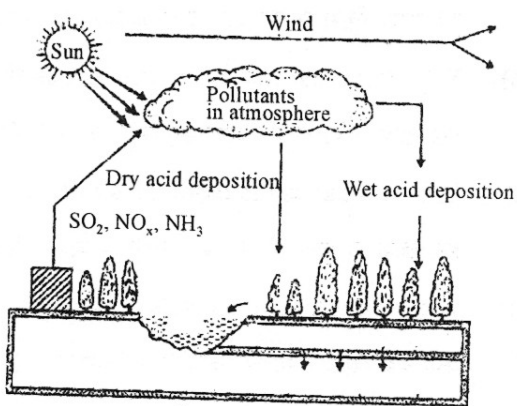
5. Which of the following characters are changed with altitude and latitude ?

- (a) Temperature (b) Rain fall
(c) Vegetation (d) Species diversity

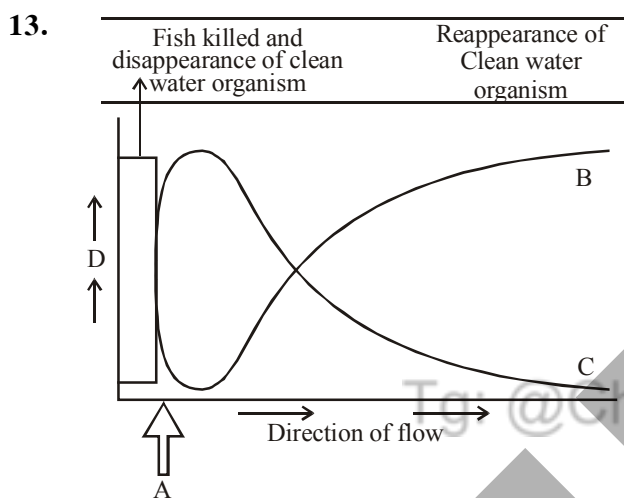
Options :

- (1) only b (2) only a and b
(3) only a, b and c (4) a, b, c & d
6. Alpine vegetation is found in :
(1) Tundra region
(2) Arctic desert
(3) Above 60°N latitude
(4) All of above
7. Which of the following place have subzero temperature :
(a) High altitude place (b) Hydrothermal vent
(c) Polar area (d) Tropical desert
(1) a & c (2) a,b & c
(3) only c (4) a,b,c & d
8. Which one of the following biome experiences minimum average annual rain fall and minimum average annual temperature :-
(1) Desert
(2) Arctic and alpine tundra
(3) Coniferous forest
(4) Temperate forest
9. Earth is an :
(1) Open system for energy and open system for minerals
(2) Closed system for minerals and open system for energy
(3) Closed system for energy and open system for minerals
(4) Closed system for energy and closed system for minerals
10. Species diversity increase :-
(1) Low altitude to high altitude and from low latitude to high latitude
(2) High altitude to low altitude, and from high latitude to low latitude
(3) High altitude to low altitude, and from low latitude to high latitude
(4) Low altitude to high altitude, and from high latitude to low latitude

ECOLOGY # 06 (ENVIRONMENTAL ISSUES)

- The pollutants which are already present in nature but are released in substantial amounts by man are known as:-
(1) Qualitative pollutants
(2) Degradable pollutants
(3) Primary pollutants
(4) Quantitative pollutants
- Secondary pollutants is/are:-
(a) Brown air (b) Grey air
(c) Acid Rain (d) DDT
(1) a, b and c are correct
(2) a and b are correct
(3) b and d are correct
(4) a and c are correct
- Water pollution Act was passed by the government of India in
(1) 1974 (2) 1984
(3) 1972 (4) 1992
- Which of the following is most widely used in removing particulate matter present in the exhaust from a thermal power plant ?
(1) Cyclonic arrester
(2) Scrubber
(3) Electrostatic precipitator
(4) Catalytic converter
- Which of the following can not be a control measure to reduce particulate matter in environment:-
(1) Cyclonic separators
(2) Electrostatic precipitator
(3) Scrubbers
(4) Effluent treatment
- How many statements are incorrect :-
(a) Automobiles are major cause for atmospheric pollution atleast in metrocities.
(b) Water which contain 0.1% of impurities is harmful for drinking.
(c) As organic matter increased BOD decreases.
(d) High concentration of DDT affect Ca-metabolism in birds.
(1) One (2) Three
(3) Two (4) None
- Euro-IV are emission norms for reducing :-
(1) O_3 and CO_2
(2) NO_2 and N_2O
(3) Sulphur and aromatic compounds
(4) CO_2 and particulate matter
- Which of the statement is/are correct?
(a) Catalytic converters have expensive metals like platinum, palladium and silver as catalyst
(b) Air act was amended in year 1987 to include noise as a air pollutant
(c) A scrubber can remove gases like sulphur dioxide
(d) ESP can remove 99% particulate matter from exhaust of thermal power station.
(1) a, b & c are correct (2) b & c are correct
(3) b, c & d are correct (4) d & a are correct
- Which pollutant mainly affect the respiratory system in human and animals ?
(1) Suspended particulate matter in Air
(2) Nitrate pollution in water
(3) DDT pollution in soil
(4) Hg in water
- Term wet deposition and dry deposition is generally used for :
(1) Deposition of soil
(2) Deposition of organic matter in lake
(3) CO_2 accumulation (green house effect)
(4) Acid rain
- Which phenomenon is shown in figure ?

(1) Biological magnification
(2) Eutrophication
(3) Acid rain
(4) Photochemical smog

12. What is an effect of global warming :-
- Increased capacity of air to accommodate moisture
 - Altered wind movement pattern
 - Increased frequency of extreme events (flood, drought, etc.)
 - Altered range of disease, vectors, pathogens, etc.
- (i) only
 - (ii) and (iv)
 - (i) and (ii)
 - (i), (ii), (iii), (iv)



- A–Sewage discharge, B–BOD, C–DO, D–Concentration
 - A–Sewage discharge, B–DO, C–BOD, D–Concentration
 - A–Concentration, B–BOD, C–DO, D–Sewage discharge
 - A–Concentration, B–DO, C–BOD, D–Sewage discharge
14. BOD in a river water :-
- Remain unchanged when algal bloom occur
 - Increases when sewage gets mixed with river water
 - Give a measure of *Salmonella* in water
 - Has no relationship with organic matter present in river water
15. Kyoto protocol (1997) was endorsed for :-
- Climate change
 - Sewage treatment
 - Euro-norms
 - Forest conservation

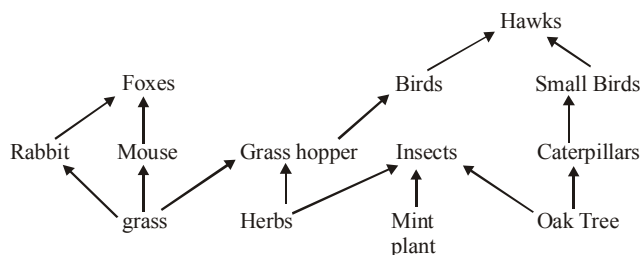
16. World summit on sustainable development (2002) was held in :-
- Australia
 - South Africa
 - Japan
 - India
17. Biological process is carried out in which type of water treatment :
- Primary
 - Secondary
 - Tertiary
 - None of above
18. Black foot disease occurs due to :-
- Cadmium
 - Mercury
 - Arsenic
 - Copper

19.

	Primary treatment of water	Secondary treatment of water	Tertiary treatment of water
(A)	Filtration	use of aeration tank	use of UV & O ₃
(B)	use of oxidation pond	use of aeration tank	use of perchlorate
(C)	Sedimentation	Anaerobic sludge digester	use of chloramine
(D)	use of UV & O ₃	catalytic converter	Activated sludge process

- Only A is correct
- Only A & B are correct
- Only A & D are correct
- Only A & C are correct

20.



An insecticide is sprayed to kill the caterpillars. In which organisms will be highest level of insecticide accumulate after a period of time:-

- Foxes
 - Hawks
 - Mouse
 - Small bird
- A only
 - A and D both
 - B only
 - A and B both

21. Match the items in column I and column II and choose the correct option :-

Column I		Column II	
(A)	UV	(i)	Biomagnification
(B)	Biodegradable organic matter	(ii)	Eutrophication
(C)	DDT	(iii)	Snow blindness
(D)	Phosphates	(iv)	BOD

The correct match is :-

- (1) A-ii, B-i, C-iv, D-iii
- (2) A-iii, B-ii, C-iv, D-i
- (3) A-iii, B-iv, C-i, D-ii
- (4) A-iii, B-i, C-iv, D-i

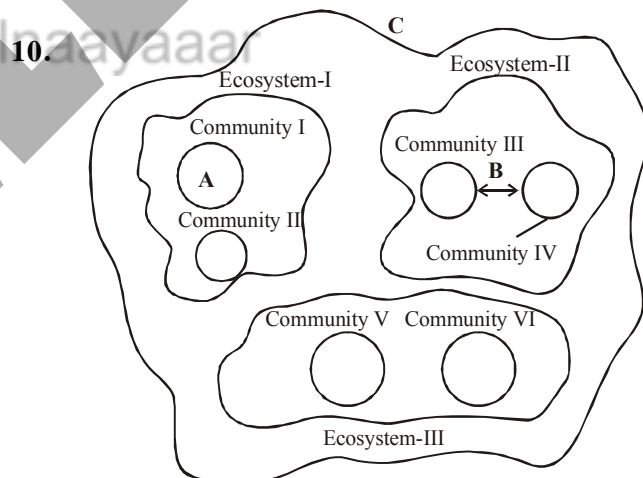
22. 'Agenda 21' is Related with :-

- (a) "The Earth summit" Held in Rio-de Janerio
 - (b) The word summit on sustainable development
 - (c) Biodiversity conservation
 - (d) Conference on Human environment Stockholm
- (1) a,b and c are correct
 - (2) a and b are correct
 - (3) b and d are correct
 - (4) a and c are correct

ECOLOGY # 07 (BIODIVERSITY AND CONSERVATION)

- Which of the following character is not related to biodiversity hot spot?
 - (1) High degree of endemism
 - (2) Habitat loss
 - (3) Lesser interspecific interaction
 - (4) High species richness
- In "rivet popper hypothesis" rivet indicates?
 - (1) Community
 - (2) Biosphere
 - (3) Ecosystem
 - (4) Species
- Western Ghat's of India is hot spot :
 - (1) It is a ecotone in two community
 - (2) It is a mega diversity zone
 - (3) It is a warm places
 - (4) It is a Hydrothermal vents
- Social forestry is :
 - (1) Planting tree on public places and common land's
 - (2) Wood species are grown in combination with herbaceous crop
 - (3) Growing ornamental and fruit tree in urban areas
 - (4) Growing tree's needed for industries in specific area
- Largest Indian national park is:-
 - (1) Desert national park (Rajasthan)
 - (2) Nagarjuna sagar (A.P.)
 - (3) Corbet national park
 - (4) Sunder Bans (W. Bengal)
- Which of the following is **correctly** matched
 - (a) Carrot grass → *Lantana*
 - (b) Farmers friend → Fungi
 - (c) Amazon rain forest → Lungs of planet
 - (d) World summit → Johannesburg
 - (1) only c, d
 - (2) b, c, d
 - (3) only d
 - (4) a, b, d

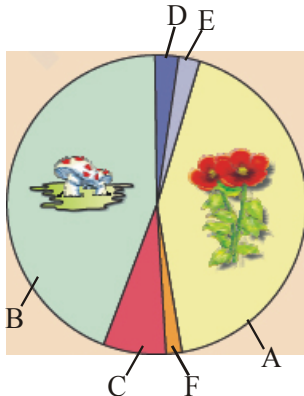
- How many example given below are the example of in-situ conservation? Tissue culture, pollen bank, national park, Biosphere reserve, Botanical garden
 - (1) Three
 - (2) Two
 - (3) One
 - (4) Five
- Extinction of stellar's sea cow is due to which of the following reasons :-
 - (1) Habitat loss
 - (2) Over exploitation
 - (3) Alien species invasion
 - (4) Co-extinction
- Kajiranga National Park is famous for :-
 - (1) One horned rhino
 - (2) Hangul
 - (3) Wild Indian ass
 - (4) Snow Leopard



In the given diagram which diversity represent by A, B, and C

- | | |
|-----------------------------|-----------------------------|
| (1) A → β -diversity | (2) A → γ -diversity |
| B → α -diversity | B → β -diversity |
| C → γ -diversity | C → α -diversity |
| (3) A → α -diversity | (4) A → α -diversity |
| B → γ -diversity | B → β -diversity |
| C → β -diversity | C → γ -diversity |

11. Identify the correct match regarding plant diversity ?



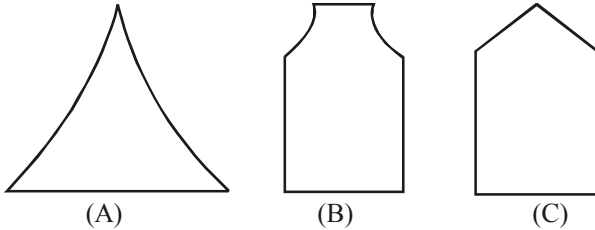
	A	B	C	D	E	F
(1)	Angiosperms	Fungi	Mosses	Algae	Ferns	Lichens
(2)	Fungi	Angiosperms	Mosses	Algae	Lichens	Ferns
(3)	Angiosperms	Algae	Fungi	Mosses	Lichens	Ferns
(4)	Angiosperms	Fungi	Algae	Mosses	Ferns	Lichens

12. India has more than 50,000 strains of rice and 1000 varieties of mango. It is related to :-

- (1) Species diversity
- (2) Genetic diversity
- (3) Ecological diversity
- (4) Temperate climate in India

ECOLOGY # 08 (DEMOGRAPHY)

1. Age structure diagrams (A, B and C) for the populations are shown below. They represent:-



- (1) A-Declining populations
B- Stable population
C- Growing population
(2) A-Growing population
B- Stationary population
C- Declining populations
(3) A-Exponential growth
B- Indeterminate growth
C- Stationary population
(4) A-Growing population
B- and C- Stable population

2. The logistic population growth is expressed by the equation :

(1) $\frac{dN}{dt} = rN \left(\frac{N-K}{N} \right)$

(2) $\frac{dt}{dN} = Nr \left(\frac{K-N}{K} \right)$

(3) $\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$

(4) $\frac{dN}{dt} = rN$

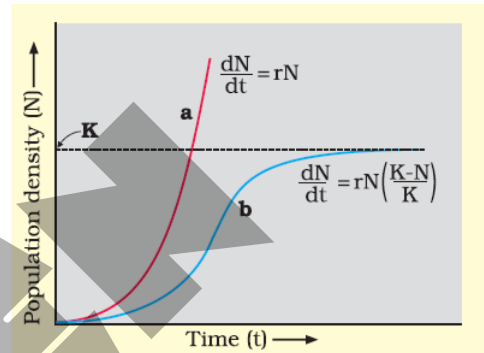
3. In a population birth rate is 0.15 and death rate is 0.08 during a unit time period. What is the value of r (intrinsic rate of natural increase) for given population ?

- (1) 0.23 (2) 0.07
(3) 0.05 (4) 0.25

4. What is the reproductive strategy adopted by bamboo to maximise its fitness ?

- (1) Breed multiple times in a life time
(2) Breed only once in a life time
(3) Produce small number of small sized offsprings
(4) Produce small number of large sized offsprings

- 5.



For the given population growth curve which statement is correct .

- (1) Curve 'a' does not show saturation because rate of population growth is very low.
(2) 'K' is carrying capacity and is specific for a given population.
(3) Curve 'a' is obtained when responses are limiting.
(4) Curve 'b' is depicted by a population of small organisms.
6. Which of the following is not an attribute of population ?
- (1) Biotic potential
(2) Dominance
(3) Natality
(4) Age pyramid